ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

NEW SERIES. VOLUME XII

1926

NEW SERIES VOL. XII NO. 1

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. MAY 4, 1926

Effects of the winter in the Arboretum. In no previous winter probably has so little damage been done to plants in the Arboretum. The few broad-leaved evergreens which can be successfully grown in this climate, like the species and hybrids of Rhododendrons which often have their foliage browned and flower-buds killed, are in perfect condition, and even the one plant of English Ivy in the Arboretum looks now as fresh and green as it did in November. It is fortunately a late spring or the exceptionally cold weather of mid-April would have destroyed the flower-buds of early flowering plants which this year are generally in good condition. The common American Elm *(Ulmus americana)*, the Red Maple, a few Willows, both arborescent and shrubbery, and the Cercidiphyllum, one of the most interesting of the large Japanese trees introduced by the Arboretum into this country, have been in flower during the past week.

Conifers. In the latest study of the conifers by the German botanist Pilger published during the present year forty-six genera with about four hundred species are admitted. Of these representatives of only nineteen genera can be grown in the Arboretum; these are Taxus, Torreya, Cephalotaxus, Abies, Pseudotsuga, Tsuga, Pinus, Picea, Pseudolarix (monotypic), Larix, Cedrus, Sciadopitys (monotypic), Taxodium (monotypic), Cryptomeria (monotypic), Thujopsis (monotypic), Thuja, Libocedrus, Chamaecyparis and Juniperus. The noblest of all conifers, the two Wellingtonias of our western coast region, cannot be grown here, and many of the largest and most interesting species of the genera represented here

have not proved hardy in the Arboretum. Some of the monotypic genera like Cryptomeria and Thujopsis are kept alive with difficulty and will probably never grow to a large size. There is certainly no larger collection of living conifers in northeastern North America, and if students of these trees in a living condition find much to disappoint them here they can see in the herbarium, which is one of the richest in this family in the world, representatives often with many species of all the genera enumerated by Pilger.

Early-flowering native shrubs. Two yellow-flowered native shrubs are in flower and are well worth the attention of the makers of American gardens by whom they have been generally neglected. These are the Leatherwood, *Dirca palustris*, and the aromatic Spice Bush, *Benzoin aestivale*. Their leafless branches are now covered with small yellow flowers, and those of the Spice Bush will be followed in the autumn by scarlet lustrous fruits. Groups of these plants can be seen on the right hand side of the Bussey Hill Road opposite the upper end of the Lilac collection.

The Cornelian Cherry. This Dogwood *(Cornus mas)*, is one of the earliest trees or tree-like shrubs with conspicuous flowers to bloom in eastern Massachusetts. The flowers are light yellow and are borne in clusters in the axils of the unfolding leaves and, although individually small, are produced in such profusion that the branches are covered with them. The flowers are followed by bright red, lustrous, oblong fruits the size of small olives. The flower-buds and the flowers of this tree are not injured by cold. The habit of the plant is good; the foliage is dark green and abundant, and the fruit, although somewhat hidden by the leaves, is handsome. The Cornelian Cherry, which is a native of Europe and western Siberia, has been an inhabitant of gardens for more than three hundred years. In the United States it was probably more often planted in the first half of the last century than it is at present, although there are not many early-flowering trees hardy in this climate which are better worth a place in the garden. In the Arboretum it may be seen with the other Dogwoods at the junction of the Meadow and Bussey Hill Roads.

Prunus Davidiana. First raised in the Arboretum from seeds collected by Dr. Bretschneider on the mountains near Peking in the autumn of 1881 and received here in January of the following year, *Prunus Davidiana* is the earliest of the Plum, Cherry, Peach and Apricot groups to flower. It is a small tree with lustrous red-brown bark, slender erect branches which form a narrow head, small flowers, narrow pointed leaves and small fruit of no edible value. The flowers are of the color of those of the common Peach-tree, and there is a form with pure white flowers. The two forms have been covered with flowers during the past week in the Peach and Apricot group on the right hand side of the Meadow Road before its junction with the Forest Hills and Bussey Hill Roads. As a flowering tree in this climate this Peach has little to recommend it for the flower-buds or the flowers are killed almost every year by late frosts, but pomolo-

gists in this country are interested in it as a possible stock on which to work the common Peach-tree, as it is hardy north of the region where the Peach thrives.

Magnolias. The earliest of the Magnolias, *Magnolia stellata*, has been in flower for several days in front of the Administration Building. This is a perfectly hardy, vigorous, wide-spreading shrub and an inhabitant of the mountain slopes of southern Japan, and, like the other early flowering Magnolias, belongs to that section of the genus in which flowers appear before the leaves. There is a variety of this plant with pale pink flowers which is also in bloom. This Magnolia is badly planted in the Arboretum, for its position on the southern side of the Administration Building induces it to flower earlier than it might in a more protected situation like the northern side of a group of conifers. In its present position the flowers are usually injured by late frosts. This year they began to open on the 24th of April and have only been slightly injured by frost. This would be a beautiful plant to grow in city yards for which its size and habit are well suited, but in the city the flowers will open even earlier and will certainly be destroyed by frost every year. Another early flowering Japanese species, *M. salicifolia*, a native of the mountain slopes of northern Hondo, is a small slender tree with narrow pointed leaves and smaller flowers than those of *M. stellata*. This little known plant is perfectly hardy in the Arboretum and is now in flower on the Centre Street Path behind the Hickories; it was introduced into American and European gardens by Professor Sargent who brought seeds from Japan in 1892.

Pieris or Andromeda floribunda. The beauty and value of this plant cannot be too often referred to in these Bulletins, for judging by an experience of over fifty years it is the only broad-leafed evergreen to which nothing ever happens in this climate. It is not attacked by borers, the leaves never become discolored, and the flower-buds formed in autumn are almost as conspicuous during the winter as the flowers, and are not injured by the lowest temperature which has been recorded in southern New England. It is a round-topped shrub of compact habit sometimes eight or ten feet across and five or six feet high, with small, pointed, dark green leaves and short terminal clusters of pure white flowers. A native of high altitudes on the southern Appalachian Mountains, this shrub is rare and local in its distribution as a wild plant, but for more than a century has been valued in England and largely propagated by English nurserymen.

Erica carnea. This is the only true Erica which is hardy here, and with its white-flowered variety has never flowered more profusely in the Arboretum. It is a common European plant which grows not more than five or six inches high but spreads into broad mats. It is an excellent plant for the edging of beds and for the spring rock garden, and should be better known and much more generally planted than it has been in this country. It has now been in bloom in the Shrub Collection for at least two weeks and is still in excellent condition.

Forsythia ovata. This native of the slopes of the Diamond Mountains of Korea was raised at the Arboretum from seeds collected by Wilson in Korea in 1918, and in its range is the most northern of the species of Forsythia, has been in bloom for more than a week. It is a large shrub distinct in its light yellow branches with broad, long-pointed, coarsely toothed leaves from four to five inches long and from three to four inches wide, and clear primrose-colored flowers rather smaller than those of *F. Fortunei* or any of the forms of *F. intermedia.* They open, too, about a week earlier than those of the other Forsythias, and this year were fully open on the 23rd of April. This Korean species promises to be a useful addition to early spring-flowering shrubs and to be hardy in parts of this country where the other Forsythias cannot be successfully cultivated. It should also prove exceedingly valuable to cross with the other species and hybrids in order to produce hardier hybrids of this useful genus.

April-flowering Rhododendrons. The earliest of these, the Siberian *R. dahuricum,* which can be seen on Azalea Path is now well covered with its small rose purple flowers. The flowers of the north China *R. mucronulatum,* which open usually two or three days later than those of the Siberian plant, are less delicate and are rarely injured by frost. On the lower side of Azalea Path there is a mass of this beautiful plant which is well worth a place in the spring garden. The plants of the hybrid Rhododendron *(R. ciliatum* x *dahuricum)* known in gardens as *R. praecox* "Early Gem" in the general Rhododendron collection are covered with expanding flower-buds. This is an interesting and handsome plant, but the flowers are very delicate and five years out of six are ruined by frost.

Docent service. Beginning on May 9th a docent will meet visitors who may desire his services at the Forest Hills gate at 3 P. M. on Tuesdays, Saturdays and Sundays; and garden clubs and groups of not less than twelve persons at any other hour if the Director is notified not less than two days in advance.

Mr. J. G. Jack of the Arboretum staff will conduct a field class on Saturdays during the spring and early summer, to assist those who wish to gain a more intimate knowledge of the native and foreign trees and shrubs which grow in New England. Instruction will be given in informal outdoor talks and in the examination of the plants. Different botanical groups will be visited at each meeting, although any trees or shrubs found may form subjects for study. No technical knowledge or special preparation is required in order to join the class as the instruction is intended to be simple in character, affording opportunities for questions and answers relating to the specimens under observation. Unless otherwise notified the class will meet promptly at ten o'clock in the morning, on Saturdays, in the Arboretum at the Forest Hills entrance, beginning May 8th. The class will close on the 25th of June. The fee for the course is $5.00, payable in advance.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 2

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. MAY 6, 1926

Prunus. In the Arboretum are now found and placed in this genus the Peaches, Apricots, Cherries, Pears and Plums. As now understood this genus contains some of the important fruit trees of temperate regions, a few valuable timber trees, and a large number of plants cultivated for the beauty of their flowers and fruits. To few genera do northern gardens owe so great and varied beauty, and in the Arboretum many of its species are now well established.

Apricots have already begun to flower and are still covered with white blooms. The earliest is a form of *Prunus Armenaica* which for several years has been growing in the Arboretum where it is called the Mikado. Judging by the name it is possible that this plant came originally from Japan where the Apricot, a native of northern China, has long been cultivated in many varieties. It is a strong-growing, hardy tree with a comparatively narrow head and erect branches. Near it in the Plum collection, also in bloom, is the Apricot from eastern Siberia and Manchuria, *Prunus sibirica*, another hardy and handsome tree. In its native country this is a low tree with a trunk sometimes three feet in diameter and wide-spreading branches. As it grows in the Arboretum it is the handsomest of the Apricots in habit and foliage.

The earliest of the Cherries, *Prunus tomentosa*, an introduction from northern China, has proved to be one of the handsomest of the spring flowering plants in the neighborhood of Boston. It is a vigorous plant five or six feet high and when well grown often broader than tall. The flowers open from pink buds as the leaves unfold and their bright red stalks and calyx make a handsome contrast with the

white petals often marked with rose. The small, lustrous, scarlet, juicy fruit which ripens in June has a good flavor and is attracting the attention of pomologists living in regions of extreme winter cold like the Dakotas and Manitoba where this native of Peking has proved perfectly hardy.

The Spring Cherry of the Japanese, *Prunus subhirtella*, the most delightful and floriferous, travellers say, of all the Japanese Cherries, is again thickly covered with flowers and has not before been more beautiful. Here in the Arboretum it is a large shrub which is not known as a wild plant in Japan. Although somewhat cultivated in the gardens of western Japan, it is uncommon in those of Tokyo and often escapes the attention of visitors in the Flowery Kingdom. The rather small drooping flowers are pink when they open but gradually turn white, and those of no other Cherry-tree in the collection remain in good condition so long. Seeds, which the Arboretum plants produce in great quantities, do not reproduce the parent plant, however, and the seedlings grow usually into the tall slender trees which botanists know as *Prunus subhirtella* var. *ascendens*. This tree has generally been overlooked or neglected as a garden plant but is now flowering in the Arboretum. Much better known is the form of *Prunus subhirtella* (var. *pendula*) which has been long a favorite garden plant in Japan and was sent many years ago to Europe and then to the United States. This beautiful plant, which is perfectly hardy in Massachusetts, has often grown badly here and died before its time because a European Cherry has been used as stock on which this variety has been grafted. The proper stocks for the Weeping Cherry are the seedling plants of *Prunus subhirtella* and its varieties. To show how easy it is to propagate the early Spring Cherry nurserymen are invited to examine the two plants at the entrance to the Superintendent's house at the corner of Centre Street. These were grafted on seedlings of the type in January, 1917; they were planted in the spring of the same year and placed in their present position in 1919. They show that there is no difficulty in raising good specimens of this plant if nurserymen are willing to give a little attention to disseminating one of the most beautiful flowering plants it is possible to grow in this climate.

Prunus serrulata sachalinensis. It is well to call attention again to this tree as when in flower it is the handsomest of the large trees yet introduced into the United States and Europe by the Arboretum. It was first raised here from seeds sent from Japan in 1890 by Dr. J. Sturgis Bigelow of Boston, and again in 1892 from seeds gathered in Japan by Professor Sargent. The trees raised from these seeds have flowered now for several years. As they produce fruit abundantly which ripens in June there is no reason why this splendid tree should not become common in the northern states. Some American city or town can well make itself famous by planting a long avenue of these trees which when they have become forty feet high or more and are in bloom will attract visitors from remote parts of this country.

Prunus yedoensis. This blooms a little later than the Sargent

Cherry, and there is a plant of this species on the right hand side of the road from the Forest Hills entrance. This is the Cherry so generally planted in the parks, cemeteries and streets of Tokyo, and its flowering heralds an annual national holiday decreed by the Emperor. It is believed that over two hundred and fifty thousand trees were growing in the precincts of Tokyo before the destruction of a large part of the city a few years ago by fire and earthquake. This Cherry is a quick growing and short-lived tree, with wide-spreading, slightly drooping branches forming a wide flattened head. The bark is pale gray and smooth, becoming darker and somewhat rough on old trunks. The slightly fragrant flowers are produced in clusters of two or several usually before the leaves but occasionally at the same time, and vary in color from white to pale pink. It is this tree which was presented by the Government of Japan to our Government, and is the principal Japanese Cherry which has been planted in Washington. It produces seeds abundantly in the Arboretum and in Washington, and it ought to be more generally planted further south than Massachusetts where the flower-buds are often injured by severe winters.

Prunus nigra. Among American Plums in the Arboretum, *Prunus nigra*, the so-called Canada Plum, is the earliest to bloom. It is a native of the northern border of the United States from New Brunswick westward, and is distinguished from the more southern *P. americana* by its larger and earlier flowers, the blunt teeth of the leaves and by the darker and closer bark; the flowers, too, turn pink as they fade. The Canada Plum has produced some excellent seedling forms which are esteemed and grown by pomologists.

Prunus salicina, better known as *P. triflora*, blooms only a little later than the Canada Plum, and the flower-buds which completely cover the wide-spreading branches are already opening. This tree is interesting because it is the only native Plum in eastern Asia, and the tree from which the so-called Japanese Plums of gardens have been developed.

Prunus triloba. Among the flowers of early spring few are more lovely than those of this small Almond from northern China which, in spite of the fact that it has flowered in the Arboretum every spring during the last twenty years, is still very little known, although a form with double flowers (var. *plena*) is a common garden plant in this country and is often successfully forced under glass for winter bloom. The single-flowered plant should be better known; it is a tall shrub of rather open irregular habit of growth. The pure clear pink flowers are produced in profusion, and among the shrubs introduced into the Arboretum in the last thirty years none exceed in beauty the single-flowered form of this plant. It can be seen on the right hand side of the Forest Hills Road not far below the entrance.

Prinsepia sinensis is again covered with clusters of bright yellow flowers which spring from the axils of half grown leaves. It is a tall broad shrub with long, gracefully ascending and spreading branches and stems armed with numerous spines. This member of the Rose

Family is perfectly hardy and the handsomest shrub which Manchuria has contributed to western gardens. The two specimens in the Arboretum were sent here from St. Petersburg in 1903 and 1906 and have been found difficult to propagate. In recent years fortunately one of the plants has produced a few seeds, and as these have germinated there is reason to hope that this shrub may become a common ornament in northern gardens. It has much to recommend it as a hedge plant. The species from northern China can be seen to advantage in the Shrub Collection.

Corylopsis Gotoana has been in bloom for more than a week and has never been so full of flowers. This is an Asiatic genus of the Witch Hazel Family, with fragrant yellow flowers in long drooping clusters and leaves which have a general resemblance to those of the Witch Hazel. *C. Gotoana* was introduced into the Arboretum from central Japan and is the largest and handsomest species, growing from five to eight feet tall in this climate, and may be considered one of the handsomest of the early spring flowering shrubs. In the Arboretum it can best be seen on the Centre Street Path in the rear of the Hickories.

Daphne Mezereum and its white-flowered variety were in bloom two or three weeks ago. These are dwarf European shrubs with erect branches, and have become naturalized in several places in the northern states. A more beautiful plant, *D. Cneorum*, is coming into flower in the Shrub Collection and on the lower side of Azalea Path. This is one of the most beautiful and satisfactory, hardy, early flowering shrubs and is not common enough in American gardens. In the Arboretum it can be seen in the Shrub Collection and on the lower side of Azalea Path. It forms a broad mat of wiry semiprostrate stems covered with dark green leaves and terminating in dense heads of rose-colored fragrant flowers. This is one of the plants which with the same treatment and in the same soil succeeds in some gardens and fails utterly in others. Fortunately it does well in the Arboretum and when in bloom is one of the most admired plants in the collection, and in Rochester, New York, where there are now many plants raised from seeds obtained from plants in Victoria Park at Niagara Falls, it is considered the very best of the early blooming shrubs.

Viburnum fragrans is now blooming more freely than in previous years. It is a deciduous shrub from northern China only recently introduced and still little known, and has obovate-oblong, sharply dentate leaves glabrous beneath, and flowers which open with or before the leaves, very fragrant, and white with very pinkish buds. Judging from the Arboretum plants this year this promises to be one of the handsomest of all Viburnums. It can be seen growing on the left hand side of the road in the bed at the turn up Bussey Hill.

Docent service. Beginning on May 9th a docent will meet visitors who may desire his services at the Forest Hills gate at 3 P. M. on Tuesdays, Saturdays and Sundays; and garden clubs and groups of not less than twelve persons at any other hour if the Director is notified not less than two days in advance.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 3

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. MAY 11, 1926

Double-flowered Japanese Cherries. That there is a fast growing demand for these trees in this country is shown by the number of letters received at the Arboretum asking information about them. It must be acknowledged that generally these double-flowered Cherries have not proved a success in this country. This is not the fault of the plants or the climate, as can be seen in the Arboretum, but of the methods adopted by nurserymen for their propagation. There are now growing in the Arboretum thirty-two double-flowered forms of *Prunus Lannesiana* and eighteen forms of *Prunus serrulata sachalinensis*. These are the only two species, the double-flowering forms of which are worth cultivation in this country. Of them the handsomest here are the following forms—*Prunus serrulata sachalinensis:* Albo-rosea, Fugenzo, Sekiyama, Kirin, Horinji, and Hisakura, and of all double-flowered Japanese Cherries the two forms of *Prunus serrulata, sachalinensis* called Albo-rosea with white flowers and Fugenzo, often known as James H. Veitch, with deep pink flowers, have given the greatest satisfaction in the Arboretum. The best six double-flowered forms of *Prunus Lannesiana* are, *Jonioi, Miyako, Sirotae, Amanogawa, Ojochin,* and *Ochichima.*

To most American nurserymen the proper production of these Cherries will appear a slow and expensive operation but unless they adopt this plan these plants will never succeed, and the demand for them will soon disappear. Seedlings of *Prunus serrulata sachalinensis* are essential as stock on which to bud or graft the double-flowered varieties. The seeds of this tree cannot be imported from Japan with any confidence, as this is a northern form and Japanese seed dealers would

hardly send north to gather seeds when other species or varieties are easily obtained in the neighborhood of Tokyo. Although the Arboretum has been distributing the seeds of this noble tree, which can be successfully grown from Canada to the Potomac and from the Atlantic to the Pacific, this country can only depend on the five large trees growing here, the two trees in the Boston Park System, a tree at North Easton, Massachusetts, and the trees in the parks at Rochester, New York, for the seed. It will require ten or twelve years for the seeds planted now to produce plants large enough to flower and produce a little fruit, and if this is planted, it will require at least six years to grow the stock large enough to bud or graft with the double-flowered varieties. This means that the American nurserymen who really want to make a success in growing these double-flowered plants must be prepared to devote eighteen or twenty years to getting his plants of a suitable size to sell. Another essential thing is that they allow at least two of their original seedlings planted in good soil and with abundant space for development to grow permanently, so that the nurseries may be assured of abundant seeds for all future needs.

A collection of twenty-five trees of these double-flowered Cherries which were grafted in 1915 on *Prunus serrulata sachalinensis* have been planted on the southern slope of Bussey Hill and have never before given such a promise of flowers which will probably be opened soon after this Bulletin reaches its readers.

Asiatic Crabapples. Among the popular plants in flower the end of this week are some of the early flowering Chinese and Japanese Crabapples. The flowers of these trees make one of the principal spectacular displays of the year, and only the flowers of the Lilacs attract a larger number of visitors. Among these Crabapples are several small trees and shrubs which should find a place in every northern garden, for they are conspicuous when covered in April or northward in May with their white or rose-colored flowers, or in autumn when their branches are loaded with brilliant red, scarlet or yellow fruits. These Crabapples grow best in cool, rich, deep, well-drained soil and lime does not interfere with their successful development. Some of the wide-branching species lose their beauty of habit unless sufficient space is allowed for their free growth, and nearly all these Crabapples look better as isolated specimens than when crowded together in too compact groups. Crabapples, like many other plants of the Rose Family, are liable to be attacked by the San Jose scale which unless kept in check can seriously injure them. For many years much attention has been paid at the Arboretum to these plants, and a large and now almost complete collection of the species and recognized hybrids has been assembled. In the future it can be undoubtedly increased by the introduction of new hybrids for these plants hybridize freely, and from seeds gathered from species in a collection like the one in the Arboretum distinct new forms are certain to appear. The Asiatic Crabapples are arranged in two groups. The oldest of them is on the left hand side of Forest Hills Road and the other, which is larger and more complete, at the eastern base of Peter's Hill.

Malus baccata mandshurica is the earliest of these Crabapples to open its flowerbuds in the Arboretum. A native of Manchuria, Korea and northern Japan, it is an eastern form of the better known *Malus baccata*, the Siberian Crabapple, which reached Europe more than a century ago and for a long time was one of only two Asiatic Crabapples known in western gardens. The Manchurian plant as it grows in the Arboretum is a tree twelve or fifteen feet tall and broad; the flowers, which are produced in profusion, are pure white, rather more than an inch across, and more fragrant than those of any other Asiastic Crabapple. The fruit is round, yellow or red, and not larger than a large pea. Another form of *Malus baccata* (var. *Jackii*) is also growing in the Peter's Hill Group. This plant was brought from Korea by Professor Jack in 1905 and is distinguished by its much larger, dark scarlet fruit.

Malus robusta is one of the earliest of these plants to flower. This is believed to be a hybrid of *M. baccata* with *M. spectabilis*. In some of the earlier issues of these Bulletins it has been called *M. cerasifera*, a name now found to have been incorrectly applied to it. In good soil and with sufficient room for free development it will grow into a large shapely tree with a broad, round-topped, irregular head of spreading and often drooping branches. The flowers are fragrant and larger than those of the other Asiatic Crabapples with pure white or occasionally greenish petals. The globose dull red fruit varies greatly in size on different individuals but is rarely more than three-quarters of an inch in diameter. To this hybrid belong many of the trees cultivated for their fruit in cold countries under the general name of "Siberian Crabs;" of these trees the well known "Red Siberian" is a typical representative. A new form of *M. robusta*, (f. *persicifolia*) raised from seeds collected by Purdom in northern China, distinct in its narrow peach-like leaves, is now established in the Arboretum and may when better known prove to be worth general cultivation.

Malus micromalus, which is also an early-flowering plant, is one of the least known of the Crabapples. The habit of this plant is more pyramidal than that of other Crabapples and this habit makes the plants conspicuous in the collection. The small, pale pink, delicate flowers which will be followed by light yellow fruit, often rose color on one cheek. A plant of *Malus micromalus* first came to the Arboretum from the Paris Museum in 1888 and the plants now growing here are descendants of that plant. It is still one of the rarest of the Asiatic Crabapples in western gardens.

Malus Halliana is a semidouble form, of uncertain origin. The double-flowered form has long been a favorite in Japanese gardens, where it is frequently cultivated under the name of "Kaido," and is believed to be a native of Japan. The Parkman Crab, as the semidouble-flowered form is generally known in this country, was one of the first Japanese plants to reach the United States direct from Japan as it was sent to Boston in 1862 where it was first planted by Francis Parkman, the historian, in his garden on the shores of Jamaica Pond.

From this tree has been produced most of the plants of this Crabapple now growing in America and probably in Europe. The Parkman Crab is a small vase-shaped tree with erect and spreading branches and dark bark. It flowers profusely every year and the flowers, which droop on slender stems, are rose-red and unlike in color the flowers of other Crabapples. The fruit, which is borne on long erect stems, is dull in color and hardly more than one-eighth of an inch in diameter. The Parkman Crab when in flower is one of the handsomest and most distinct of Crabapples, and its small size makes it one of the best of them all to plant in small gardens.

Malus floribunda. This beautiful tree has long been considered a hybrid of uncertain Chinese origin, and the plant cultivated in American and European gardens is certainly the parent of several hybrids. The handsomest of these probably is *Malus arnoldiana* which appeared many years ago in this Arboretum among seedlings of *M. floribunda.* The other parent is probably the hybrid *M. robusta.* It is a low tree with wide-spreading, slightly pendulous branches with the abundant flowers of *M. floribunda,* but the flowers and fruit are nearly twice as large as those of that tree. There is not perhaps a more beautiful Crabapple in cultivation. Like other hybrids, it can only be increased by grafts or cuttings, and is still rare in gardens. A better known hybrid of *M. floribunda, M. Scheideckeri* appeared in Germany several years ago. The broad pyramidal habit of this tree suggest *M. spectabilis* which is probably the other parent. This hybrid flowers here earlier than *M. floribunda.* The bright rose pink flowers which are often semidouble are produced in great profusion and are followed by bright yellow fruit sometimes three-quarters of an inch in diameter.

Malus Sieboldii was introduced from the gardens of Japan into Europe by Von Siebold in 1853. It is a low, dense shrub of spreading habit with the leaves on vigorous branchlets three-lobed, small flowers tinged with rose in color, and small yellow fruits. Von Siebold's Crab is really a dwarf form of a tree common on the Korean Island of Quelpaert, and on the mountains of central Japan and Hokkaido, to which the name var. *arborescens* has been given. This is a tree often thirty feet or more tall, with ascending wide-spreading branches, twiggy branchlets and minute fruit yellow on some and red on other individuals. Although the flowers are small, they are produced in immense quantities, and this species has the advantage of flowering later than the other Asiatic Crabapples.

Malus Sargentii from salt marshes in the neighborhood of Mororan in northern Japan, where it was discovered by Professor Sargent in 1892, has qualities which give it a field of usefulness peculiarly its own. This species is a dwarf with rigid and spreading branches, the lower branches flat on the ground. The flowers are in umbel-like clusters, saucer-shaped, round and of the purest white, and are followed by masses of wine-colored fruit which is covered by a slight bloom and unless eaten by birds remains on the plants well into the spring.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 4

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. MAY 19, 1926

Lilacs. When this Bulletin reaches its readers many of the earliest Lilacs will probably be in bloom and there is every promise that Lilacs this year will be unusually full of flowers. A large part of the Arboretum collection consists of seedling varieties of the plant which has been a favorite in gardens for centuries and to most persons the only Lilac, the *Syringa vulgaris* of botanists. It is now known that it came originally from the mountains of Bulgaria and that it reached western Europe from Constantinople about 1560. The date of its introduction into the United States is not known, but it was probably in the seventeenth century. There are now in the Arboretum collection twenty-seven species of Syringa, three hybrids and about one hundred and ninety forms of *S. vulgaris;* and Lilacs will be in bloom from the receipt of this Bulletin until the end of June. There are specimens in the collection raised some twenty years ago from seeds of the wild Bulgarian plant. These are interesting because it is possible by comparing them with modern Lilacs to see the change that selection and cultivation has made in these plants. Hardly a week passes that the Arboretum does not receive a letter for the names of the best six, or the best twenty-five Lilacs. Most of the varieties of the common Lilac are handsome plants, and no two persons ever agree as to their value, some preferring flowers of one color and others another. To study the Lilacs in flower in the Arboretum will prove the most satisfactory method of making a choice suited to individual taste. Most of the common Lilac forms have much the same habit and foliage and all have inconspicuous fruit; they all bloom freely every year. Breeding

and selection, however, have somewhat affected the perfume of their flowers as it has that of many plants, such as some of the modern Roses. There is considerable variation in the size of the flowers; the double flowers generally open a little later than the single flowers and last longer, but there is really little difference in the time of flowering of all these plants. The size of the flower-cluster varies somewhat on different forms and is larger on young plants than on old ones, and it can be enlarged by severe pruning which increases the vigor of the flowering branches. The plants are labeled and many of the kinds growing in the Arboretum can be found in American nurseries.

Syringa persica is a beautiful plant with slender, drooping, wide-spreading branches, narrower leaves than those of the common Lilac, and small, fragrant, lavender-colored flowers in short compact clusters. It was for many years universally believed to be native to Persia or some adjacent country. It is now known to be native to northwestern China and to have been brought originally from the east to western Asia and Europe just as the Peach and other Chinese plants found their way westward. There is a variety with white flowers and another with laciniate leaves. The first hybrid Lilac appeared in the Botanic Garden in Rouen in 1777 where it was raised from seed of *S. persica* var. *laciniata*, no artificial cross having been made. This is one of the most delightful of all Lilacs and grows into a bush twelve feet high and broad, and of rather open habit. It is very hardy, blooms freely every year, and should be in all gardens where the Lilac is cultivated. Its flowers resemble those of the Persian Lilac, but are produced in small clusters from numerous pairs of lateral buds on the same branchlet and appear as one large inflorescence sometimes two feet long, and so heavy that the slender branches bend under the weight. There are forms with dark red flowers and with nearly white flowers. Through a misunderstanding as to its origin this plant must be called *S. chinensis*.

The white-flowered *S. affinis* is usually the first Lilac to bloom in the Arboretum. The earliness and delightful fragrance of the flowers give value to this plant for the spring garden. The variety with mauve-colored fragrant flowers (var. *Giraldii*) is blooming as usual; it is a tall shrub, and except when in flower of no decorative value. The north China *S. oblata* is one of the handsomest of the species, with thick lustrous leaves which in the autumn assume brilliant shades of orange and red. The flower-buds, however, are too often injured in this climate, although the plant is otherwise hardy. By crossing this plant with a double-flowered form of *S. vulgaris* the hybrid known as *S. hyacinthiflora* was obtained many years ago. It is a large shapely bush with good foliage and small clusters of double flowers as fragrant as those of *S. oblata*. A Chinese Lilac discovered by Wilson, *S. pinnatifolia*, is also in bloom. The pinnate leaves of this plant make it interesting among Lilacs, but the small white flowers in short clusters are without ornamental value. The flowers of another rare species, *S. Meyeri*, will soon open and this year the species and garden forms are all well covered with flower-buds.

Late Flowering Lilacs. Among these are plants which can add

much to the beauty of northern gardens in the last weeks of June and early July. They are eastern Asiatic with the exception of the Hungarian *S. Josikaea*, which is the only one of these plants which has not been introduced into gardens since the Arboretum was established. The first of the late-flowering true Lilacs from eastern Asia which reached the Arboretum was *Syringa villosa* which was raised here in 1882 from seed sent by Dr. Bretschneider, at that time attached to the Russian Embassy at Peking. This has proved the most valuable of these plants; it is perfectly hardy, grows rapidly into a large, round-headed, compact bush often fifteen feet high and broad, and flowers every year. The flowers, which are arranged in long narrow clusters, are pale rose-pink, flesh color or occasionally nearly white. This is the only one of the late-flowering Lilacs which has been used successfully by the plant breeder. Crossed in the nurseries of the Muséum d'Histoire Naturelle in Paris with *S. Josikaea* it produced a race of Lilacs of vigorous growth with the habit of the Chinese plant, and in some of its forms with flowers more deeply tinged with the violet color of the Hungarian parent. To the handsomest of these hybrids the name Lutèce has been given. No shrub of recent introduction better deserves a place in our gardens. Another plant of this race known as *Eximea* differs in its much more compact clusters of rose-colored or reddish flowers which on opening become light pink. Another late-flowering Lilac which promises to be valuable as a garden decoration in this climate is *S. Wolfii* which reached the Arboretum in 1906 from Petrograd where it had been sent from northern Korea or Manchuria by the Russian traveler Komarov. *Syringa Sweginzowii*, a northwestern China plant, came to the Arboretum from Petrograd in 1910; it is a tall narrow shrub with slender erect stems, dull green pointed leaves, and long narrow flower-clusters. Not very unlike this species in habit, *S. yunnanensis* from southwestern China differs in its more fragrant flowers which are white tinged with rose color. Another related species, *S. microphylla*, is interesting because unlike other Lilacs it flowers in the Arboretum twice during the year, once in the middle of June and again in October. The nearly white flowers are pleasantly fragrant. *S. tomentella*, an older name for the plant later called *S. Wilsonii*, is a tall, vigorous, fast-growing shrub with erect stems, dull green leaves, and open, long-branched panicles of pale rose-colored flowers. *S. Julianae*, like the last, a recent discovery in western China, is a late-flowering plant closely related to the north China *S. pubescens*. Two recently described species, *S. reflexa* and *S. Komarowii* from western China, with leaves very similar to those of *S. villosa*, promise to be useful garden plants. The first is conspicuous at this season of the year, for unlike those of all other Lilacs the flowers are gracefully arching and pendent on long stems. In habit *S. Komarowii* resembles *S. reflexa* but differs from that species in the denser flower-clusters which are spreading or nodding.

Tree Lilacs. The Lilac season closes with the flowering of the eastern Asiatic species popularly known as "Tree Lilacs." They all have handsome dark green leaves which fall in the autumn without change of color, and large usually unsymmetrical clusters of white

flowers with the disagreeable odor of the Privet. They are handsome hardy plants and when in bloom the most conspicuous of the trees or large arborescent shrubs of their season. The first of them to flower, *S. amurensis*, is a native of eastern Siberia and a shrub twelve or fifteen feet high, with dark-colored bark, leaves pale on the lower surface, and short unsymmetrical flower-clusters usually produced only in alternate years. *S. pekinensis* blooms a little later; it is a native of northern China and a shrub sometimes thirty feet tall and broad, with stout spreading stems covered with yellow-brown bark separating into thin plate-like scales like that of some Birch trees. This species retains its leaves later in the autumn than the other "Tree Lilacs" and flowers profusely every year. The last of the "Tree Lilacs" to bloom, *S. japonica*, is a tree sometimes forty feet high with a tall straight trunk covered with lustrous brown bark like that of a Cherry-tree, a round-topped head of erect branches, broad thick leaves, and mostly symmetrical flower-clusters often eighteen inches in length.

Early Flowering Asiatic Azaleas. The earliest of these to bloom, *Rhododendron mucronulatum*, a native of northern China and Korea, is already out of flower. This beautiful plant has flowered every spring in the Arboretum for nearly twenty years. It is a tall, deciduous-leafed shrub inclined as it grows old to a straggling habit. It is one of the handsomest April flowering shrubs which can be successfully grown in this climate. There is a large clump of it on the lower side of Azalea Path on Bussey Hill. Already in bloom on this path are the Korean Azaleas, *R. Schlippenbachii* and *R. poukhanense*. *R. Schlippenbachii* is one of the commonest shrubs of Korea, and is often the dominant undergrowth in open woods. From Korea it crosses into northeastern Manchuria, and it is known in a few localities in northern Japan. In Korea this Azalea on the wind-swept, grass-covered cliffs of the coast grows less than a foot high and is covered with flowers. In the forest of the interior it often grows to a height of fifteen feet and forms a tall and shapely bush. It grows naturally further north than any other Azalea with the exception of the North American Rhodora. *R. Schlippenbachii* has flowered now for several years in the Arboretum, and planted in an exposed sunny position it has never suffered from cold. Its hardiness and the beauty of its flowers make it one of the most valuable shrubs, if not the most valuable, which northeastern North America has obtained from northeastern Asia. The flowers are perhaps more beautiful than those of any other Azalea. Although probably unknown as a garden plant beyond the limits of the Arboretum, *R. poukhanense* deserves a place in all New England collections. Another Japanese species, *R. reticulatum*, more generally known as *R. rhombicum*, now well established in the Arboretum, has opened its flowers. This plant is common over a large part of Japan, growing on open wind-swept hillsides, on the borders of forests and in the shade of thick woods. The flowers are deep magneta color, red-purple or rose color, and do not harmonize with those of several other Azaleas, but when this species is isolated or planted with the white-flowered form (var. *album*) it is when in bloom one of the most beautiful and distinct of all hardy Azaleas.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 5

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. MAY 24, 1926

Horsechestnuts and Buckeyes. Horsechestnut as generally applied is the name of the Old World species of Aesculus, and Buckeye is used for the American species of this genus. The Old World species which are found in southeastern Europe, on the Himalayas, in central and northern China and in Japan have white flowers often marked or tinged with yellow, but the flowers of the American species are yellow, red, scarlet, red and yellow, and white. The Old World species are best distinguished from those of the New World by the resinous exudations which thickly cover their winter-buds and are not found on those of the American species with the exception of the one which grows in California. The original Horsechestnut, *Aesculus Hippocastanum*, long cultivated in western Europe but only recently known to be native to the mountains of Greece, is the handsomest of the genus and one of the most splendid trees of the world. The date of its introduction into the United States is not accurately known but it was received by John Bartram from England in 1746, and it first flowered in the New World in his garden. On Wednesday, April 13, 1785, Washington received small plants of this Horsechestnut from Colonel Henry Lee of Westmoreland, Virginia, and planted them at Mount Vernon. All these plants disappeared long ago. The finest plant in the neighborhood of Boston known to the Arboretum is in a garden in Salem, Massachusetts, believed to have been planted one hundred and ten years ago and now seventy feet high with a trunk ten feet in girth, and a perfectly shaped head eighty feet across. It was a favorite tree with Benjamin Bussey who bought his place in Jamaica Plain in 1806 and probably planted Horsechestnut trees

there a little later. A few of them are on the walk which led from his house to Bussey Hill, and these are no doubt the oldest planted trees in the Arboretum. The European Horsechestnut only flourishes in deep cool soil, and although it has been largely used to shade city streets in this country and in Europe, it is not suited for such a purpose for the heat and drought of cities often cause it to lose its leaves in midsummer. Its place is in parks and gardens and by country roadsides. There are several hybrids of the Grecian Horsechestnut and the red-flowered American Buckeye which are handsome trees. The best known of these hybrids, *A. carnea*, is the "red-flowered Horsechestnut which is a common tree in the suburbs of Boston. More conspicuous when in flower is var. *Briotii*. The Himalayan Horsechestnut and the species of central China have not proved hardy here, and it has not yet been possible to establish satisfactorily the north China Horsechestnut in the Arboretum. The Japanese species, *A. turbinata*, is hardier and grows fairly well here, although it is less satisfactory in cultivation in this country and generally a less beautiful tree than the Chinese species.

Buckeyes. The earliest of these trees to flower here are the Ohio Buckeye *A. glabra* and its varieties. They are small trees with small yellow or yellow-green flowers and fruit covered like that of the Old World Horsechestnut with prickles. Perhaps the most interesting form is the one on which the flowers are tinged more or less deeply with pink, rose color and red; if for no other reason, it is interesting because it is the only tree which is known to have been discovered by Washington. He gathered the seeds near the mouth of Cheat River in what is now West Virginia in 1784, and planted them in April of the following year. In 1914 there were seven of these trees growing at Mount Vernon and the largest was seventy-five feet tall with a trunk two feet four inches in diameter. Some of them were destroyed by the storm of 1924, and most of them lost parts of their heads. It is now known that this variety grows as far south as White Sulphur Springs and crosses from West Virginia into Tennessee and Ohio. Unfortunately it has been named var. *virginica* for the name of Washington should certainly have been connected with it. Plants raised from grafts collected by Mr. John S. Ames at White Sulphur Springs in 1921 are now growing in the Arboretum. *A. georgiana*, a comparatively recent discovery in central Georgia and now established in the Arboretum, is a first-rate garden plant here with short compact clusters of large yellow and red flowers. A beautiful plant is the red-flowered variety of *A. discolor* (var. *mollis*) which will soon be covered with its scarlet flowers. Generally distributed from the coast of North Carolina to southern Arkansas and western Texas, and when in bloom one of the most brilliant plants of the south, it has been found that it can be successfully grown in Massachusetts. A single tree of an interesting hybrid Buckeye, *A. Bushii*, was found a few years ago in the woods near Fulton on the Red River in Arkansas, and evidently was produced by the crossing of a form of *A. glabra* with the red-flowered *A. discolor* var. *mollis*. The original tree has disappeared but the hybrid is fortunately preserved in a tree growing on Peter's Hill in the Arboretum where it has flowered for several years.

Perhaps this is the rarest tree in the Arboretum. Several other Horsechestnuts with red and yellow flowers are handsome flowering trees; they are natural hybrids which originated in Europe more than a century ago between the yellow-flowered *A. octandra* and one of the red-flowered southern Buckeyes. The name of this hybrid is *A. versicolor*. It appears to have been better known in gardens before the middle of the last century than it is now.

Aesculus parviflora will not be in bloom before July when it occupies an important place among summer-flowering shrubs. Fortunately this native of the southern states is hardy in the north, and with abundant space and in good soil will spread into great thickets with stems seven or eight feet high which are covered with tall, narrow, erect spikes of small white flowers which stand well above the foliage.

Another summer-flowering Buckeye, *A. Harbisonii*, unfolds its leaves later than any other in the Arboretum with the exception of *A. parviflora*, and is the last of the group to bloom. Two individuals of this peculiar plant appeared here in 1905 among a number of seedlings of *A. georgiana* and are believed to be hybrids of that species and the red-flowered variety of *A. discolor*, the two species growing together where the seed was gathered near Stone Mountain in Georgia. The leaves of this hybrid are lighter green than those of either of its supposed parents; the flowers are borne on stout red stems in broad panicles and are about three-quarters of an inch in length, with a rose-colored calyx and canary yellow petals tinged with red toward the margins. The hybrid origin of these plants is shown by the mixture of glands and hairs on the margins of the petals, hairs only having been found on the plants of the group of Aesculus to which *A. georgiana* belongs and only glands on those of the plants of the group to which *A. discolor* belongs, so that when both hairs and glands are found on the margins of the petals it is good evidence that the plant is of hybrid origin.

Rhododendron (Azalea) Vaseyi from the southern Appalachian Mountains is flowering again profusely. Its pure pink flowers appear on the leafless branchlets and in delicacy and purity of color are not surpassed by those of any other plant. It is only in recent years that this Azalea has been known to botanists and has found its way into gardens. It is perfectly hardy, its flower-buds are not injured by severe cold, and in time it grows into a tall usually rather narrow shrub. This Azalea has been planted on both sides of the Meadow Road, the largest group being at the end of the first pond. Great masses of it can be seen now in bloom on the Riverway in Boston between Brookline Village and Beacon Street. The Japanese *R. Kaempferi* is the only red-flowered Azalea which has proved hardy in this climate. It has been largely used in the Arboretum, and its flowers, which are now opening, furnish the most surprising and spectacular display of the year; they are delicate, however, and when fully exposed to the sun lose their value. This Azalea gives more satisfaction when planted in the shade of trees or on the northern border of a wood of conifers. There are masses of it at the lower end of Azalea Path and in a large group under the shade of the Hemlocks on Hemlock Hill and on the northern edge of Hemlock Hill in a long narrow band between the Hemlocks and the Laurels. *Rhododendron*

(Azalea) luteum, a native of the Caucasus, has bloomed before several times in the Arboretum and although the buds are often injured it is in good condition this year. It is growing on the right hand side of Azalea Path below the plant of *R. reticulatum*. If the flower-buds of this Caucasian plant were hardier this would be one of the most charming of all Azaleas for the flowers are more fragrant than those of any other Azalea.

Fothergilla. The three species of Fothergilla, members of the Witch Hazel family and natives of the southeastern United States, with heads of pure white flowers and handsome Witch Hazel-like leaves, are now in bloom in the Shrub Collection and on Azalea Path in the Arboretum, and are among the most interesting and beautiful of the spring-flowering shrubs. First cultivated in England more than a century ago, Fothergilla seems to have disappeared from gardens until it was reintroduced by the Arboretum a few years ago. All the species are plants of much interest and great beauty, but it is doubtful if any of them can now be found in any commercial nursery.

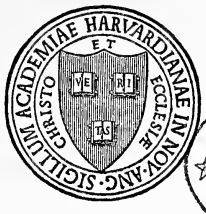
Early Flowering Viburnums. Although they are already passing out of bloom, these Viburnums are such beautiful and interesting plants that it is well to call attention to them again. The first to bloom, *V. alnifolium*, the Hobble Bush or Moosewood of cold northern woods, is one of the handsomest of the American species, with small, globose clusters of white flowers surrounded by a ring of neutral flowers, dark green leaves with prominent veins which turn orange and scarlet in the autumn, and fruit in drooping clusters which at first red turns when fully grown to dark blue or nearly black. It is growing among the Birches on the Bussey Hill Road opposite the Viburnums. Another beautiful species, the Korean *V. Carlesii*, is rightly considered one of the handsomest plants recently introduced into American gardens. Its value is in the white extremely fragrant flowers which are produced in rather small compact clusters and open from bright pink buds. As the flowers in a cluster do not all open at the same time the mixture of white flowers and pink buds adds greatly to the attractiveness of the inflorescence. It is a dwarf shrub with pale green leaves and has only rarely produced fruit in the Arboretum. Next to this species in the Viburnum collection is a plant of *V. bitchuiense* which somewhat resembles *V. Carlesii*, but the flowers are smaller and not so fragrant and the habit of the plant is less compact. Mistaken by Japanese botanists for *V. Carlesii*, this plant has been sold in the United States and Europe as the true *V. Carlesii*. *V. Carlesii* should find a place in every northern garden.

Crataegus arnoldiana. This is the earliest of the Hawthorns to bloom in the Arboretum and is a tree of considerable size first discovered growing wild here. It grows also near Medford in this state and near Lyme, Connecticut. There are five or six large plants on the borders of the Meadow Road which will be covered with flowers before this Bulletin reaches its readers. The large scarlet fruit is as beautiful and conspicuous as the large flowers.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 6

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JUNE 5, 1926

American Magnolias. Several of these trees are in bloom in the group on the right hand side of the Jamaica Plain gate. Unlike most of the Asiatic species, the American Magnolias flower after the appearance of the leaves, and are hardy and handsome trees. There are seven of these Magnolias, but one of them, *M. pyramidata*, grows only in the extreme southeastern corner of Alabama and adjacent Florida, and would not be hardy here. Of the other species, the so-called Mountain Magnolia, *M. Fraseri*, is the first to open its flowers in the Arboretum. It is a small tree, rarely more than forty feet high, with an open head of long branches, leaves often a foot in length and deeply divided at the base, and creamy white, sweet-scented flowers eight or ten inches in diameter and very conspicuous as they stand well above the crowded leaves at the ends of the branches. This Magnolia is a native of the southern Appalachian Mountain region, and, although it has not been found growing north of southeastern Virginia, is perfectly hardy in eastern Massachusetts. The next to flower is *M. cordata*, which for several days has been covered with its cup-shaped, bright canary yellow flowers unlike in color those of any other Magnolia. Discovered by Michaux on one of his journeys from Charleston, South Carolina, up the valley of the Savannah River to the high Carolina Mountains, it was introduced by him into French gardens where it flourished. For more than a century every attempt to rediscover this tree failed, and it is only within the last few years that it was found by the Berckman Brothers growing in the woods not many miles distant from Augusta, Georgia, where plants only a few feet high flower profusely. Grafts from Michaux's trees, however, preserved this tree

in cultivation, and the plants in the Arboretum were raised from grafts taken from old trees in the Harvard Botanic Garden for which they were imported from Europe probably when the Garden was laid out, that is more than a century ago. A little later the flowers of the Cucumber Tree, *M. acuminata*, the Umbrella Tree, *M. tripetala*, *M. virginiana* and *M. macrophylla* will open. *M. acuminata*, which is the tallest of the American Magnolias, sometimes attaining a height of ninety feet, has green or greenish yellow flowers covered with a glaucous bloom. This tree is a native of mountain slopes and rocky banks of streams from southern Ontario and western New York to Ohio and Illinois, and southward along the Appalachian Mountains to northern Georgia, central Kentucky, Mississippi and Louisiana. *M. tripetala* is a bushy tree from thirty to forty feet in height with large pure white flowers, and is widely distributed through the Appalachian Mountain region, although nowhere very abundant, from the valley of the Susquehanna River in Pennsylvania to southern Alabama, middle Kentucky and Tennessee, growing westward to southwestern Arkansas and southeastern Oklahoma. *M. virginiana*, as botanists now call the Sweet Bay, often a large tree at the south, northward is never more than a small tree or often a large shrub. The leaves are dark green and very lustrous on the upper surface and silvery white on the lower surface, and the flowers which continue to open in succession from the middle of June until August are small, cup-shaped, creamy white and delightfully fragrant. In all North America there is not a more delightful shrub or small tree to plant in a garden or one that will give larger returns in beauty and fragrance. It is, however, difficult to find in American nurseries and it is still practically unknown to American garden makers of this generation. *M. major*, often called *M. Thompsoniana*, a hybrid between *M. virginiana* and *M. tripetala*, has the general appearance of the former but has larger leaves, and larger, equally fragrant flowers. *M. macrophylla* is the last of the Magnolias to bloom in the Arboretum. A native of the southern states, it is perfectly hardy in Massachusetts where it grows to a height of thirty feet and forms a wide, round-topped head of branches spreading at nearly right angles to the trunk. This Magnolia has the largest leaves and largest flowers of any Magnolia growing in any part of the world beyond the tropics: the former are silvery white on the lower surface and from twenty to thirty inches long and from eight to nine inches wide. The expanded flowers are often a foot in diameter. Although perfectly hardy in Massachusetts, this tree is best planted in a position sheltered from the wind which often tears the large and delicate leaves.

American Crabapples. Nine species of the American plants are recognized, with several varieties and two hybrids. They have white or pink fragrant flowers which do not open until the leaves are partly or entirely grown, and green or pale yellow, fragrant fruit which, with the exception of that of the species of the northwestern part of the country, is depressed globose, usually broader than high, from an inch to an inch and a half in diameter, and covered with a waxy exudation. These are excellent plants for the decoration of wood borders and glades. *M. glaucescens*, which is named from the pale glaucous color of the under surface of the leaves, is the first of the American species

to bloom here. This is a common plant in western New York, western Pennsylvania, southern Ontario and Ohio, and ranges southward on the mountains to northern Alabama. The flowers of *M. ioensis* open several days later. This is the common Crabapple of the northern and middle western states, and in a number of varieties ranges southward through Missouri to western Louisiana and Texas. It is a tree sometimes thirty feet high with a trunk often eighteen inches in diameter and a wide open head of spreading branches. A form of this tree with double flowers (var. *plena*), the Bechtel Crab, named for the man who found it several years ago growing in the woods in one of the western states, has opened its pale rose-colored flowers which look like small roses. When in bloom this is one of the popular trees in the Arboretum. *M. coronaria*, sometimes called the Garland Tree, is the common eastern species, although it does not approach the coast north of Pennsylvania and Delaware, and ranges west to Missouri. It is a beautiful tree sometimes twenty-five feet high, with a short trunk, pink flowers rather more than an inch in diameter, and depressed globose fruit. One of the most beautiful plants when in bloom in the Arboretum is the double-flowered form of *M. coronaria* (var. *Charlottae*) which was found a few years ago in the woods near Waukegan, Illinois, and was named the Charlotte Apple in honor of the wife of the discoverer. The Arboretum plants are still small, but the flowers which are now open are fragrant, about two inches in diameter with two rows of pale pink petals, and handsomer even than those of the Bechtel Crab, the double-flowered form of *M. ioensis*. *M. platycarpa* has fruit broader than high and often two and a half inches in diameter, with a deep cavity at base and apex. The flowers are about an inch and a half in diameter with a glabrous pedicel and calyx, but in the variety *Hoopesii* with a pubescent calyx. There is a large tree of this variety in the old Malus collection opposite the end of the Meadow Road. *M. fusca*, the only native Apple-tree of the Pacific States where it ranges from Alaska to central California, is an interesting tree. It differs from the other American Crabapples in its short-oblong, yellow-green flushed with red or almost entirely red fruit from half an inch to three-quarters of an inch long, and without the waxy exudation which is peculiar to the eastern American species. The calyx of the flower, unlike that of the eastern species but like that of many of those from Asia, falls from the partly grown fruit. *M. angustifolia* is the last Crabapple in the Arboretum to flower. It is a tree sometimes thirty feet tall with a trunk eight or ten inches in diameter, wide-spreading branches, and bright pink, exceptionally fragrant flowers. This plant does not grow naturally north of southeastern Virginia and southern Illinois, ranging from Florida to western Louisiana. It has proved perfectly hardy, however, in the Arboretum where the plants bloom every year and are handsome and valuable additions to the collection. The other American species, *M. glabrata*, of the high mountains of North Carolina, *M. lancifolia*, widely distributed from Pennsylvania to Missouri and western North Carolina, *M. bracteata*, a common species from Missouri to Florida, and many of the varieties of *M. ioensis* are now established in the Arboretum. *M. Soulardii*, which is believed to be a natural hybrid between *M. ioensis* and some form of the orchard Apple (*M. pumila*), is a widely distributed and not rare tree in the middle west and one of

the attractive plants in the Crabapple collection at the base of Peter's Hill. *M. Dawsoniana* is a hybrid of the western *M. fusca* and the common Apple which appeared in the Arboretum many years ago from seed collected in Oregon. It has grown here to more than double the size of *M. fusca* with which it shows its relationship in the oblong fruit of the shape and color of the Oregon plant but about twice the size.

Bush Honeysuckles. For northern gardens there are few more beautiful shrubs than some of the Bush Honeysuckles, for in early spring they are covered with myriads of yellow, white, rose-colored or red flowers, and in summer or autumn with lustrous, usually scarlet fruits. Many of these shrubs are able to show their greatest beauty in this climate, but this can be obtained only by planting them in rich soil and with sufficient space for growth in all directions. In poor soil and when crowded by other plants they are miserable objects. The large-growing kinds, like *Lonicera tatarica, L. bella* and *L. notha,* should be planted as isolated specimens at least twenty feet from any other plant. *L. Morrowii,* a plant of the Amur region, requires even more space for its lowest branches which cling close to the ground and naturally spread over a great area. This shrub has gray-green foliage, comparatively large white flowers and bright red fruits. Among vigorous growing plants in this group attention is called to two hybrids of *L. Korolkowii* in the Shrub Collection, *L. amoena* and *L. arnoldiana.* These have gray-green foliage and small, bright pink, very attractive flowers. *L. chrysantha* from eastern Siberia, with large yellow flowers, is also a conspicuous object at this time. There is a large collection of these Bush Honeysuckles in the general Shrub Collection, and plants of a few of the larger-growing kinds have been planted in the grass border on the right-hand side of the Bussey Hill Road, opposite the Lilacs, to show how these plants can develop when sufficient room for free growth is given to them.

Exochorda Giraldii Wilsonii. This shrub was discovered by Wilson in western China and is now well established in the Arboretum where there are several plants. In cultivation here the Wilson Pearl Bush grows with a single straight stem and comparatively short branches which form a narrow pyramidal head. The flowers are much larger than those of the old-fashioned Pearl Bush, and it gives every promise of being the best garden plant of the genus. Some persons consider it when in flower the handsomest, as it is certainly the most showy of the hardy deciduous-leafed shrubs introduced in recent years from western China, and the large plants in the Shrub Collection are attracting much attention this year.

Just now the trees in the Horsechestnut and Buckeye Collection on the right-hand side of the Meadow Road are unusually full of flowers and deserve careful study by lovers of hardy trees and shrubs.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 7

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JUNE 10, 1926

Crataegus. There are now growing in the Arboretum more forms of Crataegus than of any other genus of plants; the collection now contains six hundred and fifty-four named species in addition to many unnamed plants and varieties, bringing the whole number probably up to seven hundred forms. Most of these are natives of eastern North America, where the genus is more generally represented than in any other part of the world. A few species are found in the Rocky Mountain region and in the Pacific States; there is a single species in Japan, and less than twenty in continental Asia; there are several species in southwestern, southern and central Europe, and two species in western Europe. The two species of western Europe, *C. oxyacantha* and *C. monogyna*, and many of their varieties, are established in the Arboretum and are the only foreign species which have ever been naturalized in North America where they are now abundant in some parts of Nova Scotia. One hundred and fifty years ago or more the so-called English Hawthorn was more often planted here than any of the native species, and it was with this plant that Washington struggled to make a hedge at Mount Vernon. An excellent gardener, he probably did not realize that the seeds of Crataegus do not germinate until they have been allowed to remain for two years in the ground, and as the seedlings did not appear when he expected them he dug up the seed-bed and something else was tried. Forms of this species with scarlet and with pink flowers are conspicuous, and are the only Hawthorns with colored flowers. The most beautiful, however, of all the foreign Thorns known in the Arboretum is *C. pinnatifida* from eastern Siberia and northern China. The large deeply divided leaves make this the handsomest of

the whole genus. The flowers are large and produced in profusion. A form of this species (var. *major*) with larger leaves and much larger fruit is cultivated in orchards as a fruit tree in the neighborhood of Peking.

In 1892 when the fourth volume of Sargent's Silva of North America was issued fourteen species of Crataegus were recognized. No other group of small trees and shrubs with deciduous leaves adds so much beauty for long periods of the year to our parks and gardens, and the study, description and distribution of the American species is probably the most important scientific work accomplished by the Arboretum during the first half century of its existence. Twenty of the twenty-two natural groups in which the North American species can be arranged are now largely represented in the Arboretum collection. The Aestivales and Brachyacanthae Groups, which contain some of the most distinct and interesting species of the genus, are not in the collection. The Aestivales, to which only four species are now referred, inhabit the coast region of the south Atlantic and Gulf states with another station in North Carolina. They grow where the ground is wet, usually in deep depressions often filled with water a large part of the year, and are slender trees or small, round-headed shrubs, with flowers which are as large or larger than those of any other Hawthorn. The plants are almost universally called May Haws in the regions where they grow because their scarlet fruit ripens in the spring. No species of this group has been planted in the Arboretum as there is little chance that any of them would prove hardy here. Of the two species of the Brachyacanthae Group, the "Pomette Bleue" of the Arcadians of western Louisiana, a large tree with lustrous foliage, small flowers and bright blue fruit about half an inch in diameter, is one of the handsomest of American Hawthorns, differing from all other species in the color of the fruit. A native of southern Arkansas, eastern and western Louisiana and eastern Texas, there is no chance of it ever succeeding in New England where it has been raised several times in the Arboretum. The other species of the group, *C. saligna*, is common on the banks of streams at high altitudes on both slopes of the Continental Divide in Colorado, where it is conspicuous in early autumn from the brilliant orange and scarlet colors of the leaves. Although it has been raised several times in the Arboretum, it has not been able to establish itself here.

The distribution of the different groups of the American species is interesting. The most widely and generally distributed is the Crus-galli to which the Cockspur Thorns belong. Individuals of this group do not form as large colonies as some of those of other groups, but are generally distributed from the valley of the Saint Lawrence River in the Province of Quebec to the shores of the Gulf of Mexico in western Florida and westward to Iowa, eastern Kansas and Oklahoma, and to western Texas. In the Punctatae the type of which is *C. punctata*, one of the largest of the American species, the group is northeastern but ranges southward on the high Appalachian Mountains to northern Georgia, and to Missouri and Arkansas where it has a number of representatives. Species of the Virides Group grow on the coastal plain of the south Atlantic states and in the coast region of the Gulf States to eastern Texas, western Louisiana, southern Arkansas and in the

valley of the Mississippi River as far north as Illinois. East of the Mississippi River individuals of this group are not numerous, but westward, especially in eastern Texas, they cover great tracts of low ground, and the type of the species, *C. viridis*, is under favorable conditions the most gregarious of all the American Hawthorns. In the Arboretum this group is well represented by *C. nitida*, a large tree of the bottom-lands of the Mississippi River in Illinois and one of the handsomest of all Hawthorns. The Pruinosae is a northern group but ranges southward on the Appalachian Mountains, and reaches Missouri where it is abundant with numerous species in the southern part of the state and northern Arkansas. The Tenuifoliae is a distinctly northeastern group but is largely represented on the Appalachian Mountains as far south as North Carolina, with a single species in southern Arkansas. The Coccineae Group is composed of large trees with large leaves and flowers, and large and showy scarlet fruit; it is most abundant in western New York, southern Ontario and northeastern Illinois. The Dilatatae is another group with large leaves, flowers and fruits, and is confined to the northeastern states, and to Missouri and eastern Kansas. It is well represented in the Arboretum by *C. coccinioides*, now one of the handsomest trees in the collection. The Rotundifoliae are entirely northeastern and one of the species, *C. rotundifolia*, is the most northern in its range of American Hawthorns. The Intricatae with many species are interesting because most of the representatives are small shrubs which until recent years have been entirely overlooked by botanists. The group is widely distributed from Canada to Texas, and is best represented in Pennsylvania and Michigan. This group is planted beyond the Malus collection on the lower side of the road at the base of Peter's Hill. The Uniflorae, only small shrubs with white flowers and nowhere very common, are distributed from eastern New York to Alabama and Texas. The two shrubs which compose the Triflorae, and which grow in the hill regions of northwestern Georgia and northern Alabama, are handsome plants. The Pulcherrimae, Bracteatae and Silvicolae are small groups confined to the southeastern states, with one speeies of the Silvicolae in eastern Louisiana. The Microcarpae with three species are distinguished by their small fruits and by the principal veins of the leaves which extend to the points of the lobes, as in no other species, and also to the bottom of the sinuses between the lobes. Two of these species, *C. apiifolia* and *C. spathulata*, are well scattered through the southern states; and the third, *C. cordata*, the so-called Washington Thorn, is a rare and local tree in the region from western North Carolina to southern Illinois and southern Missouri; in the Arboretum it is the last species to flower. The great Flavae Group is distinctly southeastern, with many species which vary in habit from large trees to shrubs, and are well distinguished from the species in other groups by the conspicuous glands on their leaves, petioles and corymbs, and by the hard, dry flesh of the green, orange or red fruit. Plants of this group are very common in southern Georgia, western Florida and southern Alabama, with a single species in eastern Louisiana, and in the southern Appalachian region up to an altitude of about two thousand feet. This distinct group is well represented in the Arboretum by old trees of *C. aprica* from western North Carolina. The Macracanthae, better known as the Tomentosae, is one

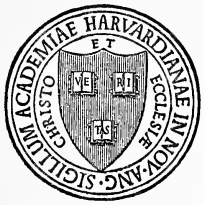
of the most important of the eastern groups, common with many species in Canada and the northern states; it does not occur in the southeastern states, the coast region of the east Gulf States and Louisiana, and is extremely rare in eastern Texas and Arkansas. The fruit of some of the northern trees of this group is perhaps more beautiful than that of the plants of any other group. The Douglasianae are black-fruited trees and shrubs of the northwestern and interior parts of the continent, with one species in the Lake Superior region of northern Michigan. All the species are growing well in the Arboretum, as are those of the Anomalae, a northeastern group related to the Macracanthae and Douglasianae by the presence of longitudinal cavities on the inner faces of the nutlets of the fruit. Some species of the Molles Group are the first of the American Hawthorns to flower. The distribution of this group is peculiar. It is represented in the valley of the St. Lawrence River, in Maine, eastern Massachusetts and northern Delaware; from western Vermont and Massachusetts and from western Pennsylvania it is common westward to eastern Nebraska and Kansas; it occurs in middle Tennessee, northeastern Mississippi and in northern Alabama. It is well represented in Missouri and in Arkansas, and in eastern Texas several species are widely distributed, abounding in the valley of the lower Brazos River and extending westward to that of the San Antonio. The largest trees among American Hawthorns are found in this group; they have large leaves more or less covered with hairs, especially early in the season, large flowers in many-flowered clusters, and large, scarlet, rarely yellow, usually dry and mealy, often edible fruit. American Hawthorns will be opening their flower-buds here during the next five or six weeks. For those parts of the country in which the soil is impregnated with lime, and in which the climate is severe, no other genus can furnish such handsome small trees and shrubs with such conspicuous flowers and fruit.

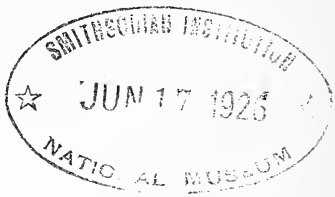
Azaleas. Several of these plants are blooming on Azalea Path, the most conspicuous being the Japanese *Rhododendron* (*Azalea*) *japonicum* with flame-colored and occasionally bright yellow flowers (var. *aureum*). Long confounded with the hybrid *Rhododendron* (*Azalea*) *mollis* of gardens, little attention has been paid to it, and it is only lately that its specific character has been understood. *R.* (*Azalea*) *roseum* is also in bloom, with deep rose-colored flowers, the fragrance of which is only equalled among Azaleas by that of the summer-blooming *R. viscosum* of northern swamps, and by many persons this southern shrub is considered the handsomest of American Azaleas with the exception of *R. calendulaceum* with its yellow and flame-colored flowers. *R. nudiflorum*, a northern shrub, with rosy pink flowers which open before the unfolding of the leaves, is also now in full bloom. *R. calendulaceum* is beginning to flower, and a few plants are already in bloom. It is an inhabitant of the mountain regions from southern New York to Georgia, and is extremely abundant on the lower slopes of the high mountains of North Carolina and Tennessee, and is a shrub with erect stems, sometimes from six to eight feet tall, and probably the handsomest of all American Azaleas.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 8

ARNOLD ARBORETUM

HARVARD UNIVERSITY





BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JUNE 15, 1926

The Arboretum in early summer. The Arboretum is never more interesting and more full of beauty than it is in the early days of June. The leaves of most of the deciduous-leafed trees have attained their full size, and this year, thanks to the abundant rains of the spring, are unusually large and not greatly disfigured by insects. The Arboretum is still full of flowers for this is the time when several American Viburnums begin to bloom, and some of them have been largely used in border and roadside plantations. The Rhododendrons have been little injured during the past winter, and some of the early forms are now in bloom. Early Cornels, Roses and Mock Oranges are already in flower. A large number of American and Old World Hawthorns, especially those on Peter's Hill, are covered with flowers and most of the plants in the Horsechestnut Group are exceptionally fine this year. Many of the American Magnolias are still in full bloom, and in the Shrub Collection can be seen the flowers of many Barberries, Roses, Spiraeas and other shrubs. In the whole Arboretum perhaps there is not a handsomer plant than the double-flowered American Crabapple known in nurseries as the Bechtel Crab.

Viburnums. There are no small trees better suited for the decoration of American parks and roadsides than the three arborescent Viburnums of the eastern United States. The first to flower, *V. prunifolium*, the Black Haw of the middle states, is a common arborescent shrub or small tree on rocky hillsides and in fence-rows, sometimes growing thirty feet high. It may be distinguished from the other arborescent species by its narrower leaves and by the absence from the leaf-stalks of the wing-like margins found on those of the others.

The clusters of pure white flowers are rather smaller than those of the other species and the fruit is dark blue covered with a glaucous bloom and remains on the branches until the beginning of winter. This is the common Viburnum of the middle states, only reaching New England in southwestern Connecticut. It is perfectly hardy in the Arboretum, however, and is the earliest of the arborescent species to flower here. The common northern arborescent species, *V. Lentago*, the Sheepberry or Nannyberry, has broad lustrous leaves and large clusters of creamy white flowers which are followed by sweet and rather juicy, nearly black or dark blue fruits. It is a common northern tree or treelike shrub often twenty or thirty feet tall, and just now is conspicuous in many parts of the Arboretum. The third arborescent species, *V. rufidulum*, is perhaps the most beautiful of all the Viburnums. This is a southern tree which does not grow naturally further north than southern Virginia and southern Illinois, and in the south is a tree often forty feet high with a tall trunk and wide-spreading branches forming a symmetrical, round-topped head. The leaves are thick, dark green and more lustrous than those of other deciduous-leafed Viburnums. The flowers are pure white and are borne in broad, flat-topped clusters, and the fruit is bright blue and covered with a glaucous bloom. It can be distinguished from the other species by the rust brown covering of hairs on the margins of the leaf-stalks, branches of the flower-clusters and winter-buds. Long an inhabitant of the Arboretum, where even in most sheltered positions it is only a shrub, it probably will never become arborescent in habit here. The best specimen can be seen on Hickory Path near Centre Street. Of the shrubby American species now in bloom mention may be made of *V. pubescens*, a plant with small pointed leaves and small, compact clusters of white flowers which are followed by shining black fruits. There is a large compact group of this plant on the right hand side of the Bussey Hill Road opposite the Lilac Group which is now covered with flowers. No other Viburnum blooms more profusely. In the same border are three Viburnums of the popular section of the genus in which the cluster of fertile flowers is surrounded by a ring of white sterile flowers. The handsomest of these plants is probably the European *V. Opulus*, the Guelder Rose. The flower-clusters are perhaps smaller than those of the other species, but the plant grows to a larger size and is more compact in habit, and the fruit is larger and of a deeper color. The Snowball of old-fashioned gardens is a form of this species in which all the flowers are sterile (var. *sterile*). There is a form with yellow fruit (var. *xanthocarpum*) and a dwarf form (var. *nanum*), which is a small compact bush which rarely flowers. *V. americanum* is a plant of looser habit, with translucent orange-red fruit which hangs on the branches until early spring. The species of northeastern Asia, *V. Sargentii*, has larger sterile flowers than the other species and is decidedly a handsome plant. These Viburnums are all flowering in the Viburnum Collection on the Bussey Hill Road where many of the Asiatic species are also now in bloom.

Viburnums of Western Asia. It is now possible to judge of the value of most of the deciduous-leafed species of China and Japan as garden plants for the northern states as nearly all of them are well established in the Arboretum. Generally they are less valuable here than the spe-

cies of eastern North America. This statement is of course a general one, for among the Asiatic species are several plants of ornamental value. The species of the Opulus Group, the sterile flowers of which form a ring of inflorescence, are larger on *V. Sargentii*, the Asiatic representative, than on the American and European species and as a flowering plant is the handsomest of the three. The Korean *V. Carlesii*, which has been described in an earlier issue of these Bulletins, is a small shrub with no particular beauty of habit or foliage, but has few rivals in the beauty of its fragrant flowers. The handsomest, however, of all the Asiatic Viburnums is *V. tomentosum*, a native of both Japan and western China. In Japan it grows to the size of a small tree, but in this country it is a large shrub with wide-spreading horizontal branches on the upper side of which the flat flower-clusters are thickly placed and are surrounded by a ring of pure white ray flowers. The fruit when fully grown is bright scarlet but becomes black at maturity. This is certainly one of the handsomest of the shrubs which has been brought from eastern Asia into this country. There is a Japanese form in the collection with narrower leaves (var. *lanceolatum*), and two Snowball forms. The more common of these is a large, vigorous and hardy shrub which is covered every year with small compact heads of white sterile flowers. In nursery catalogues it usually appears as *V. plicatum* but the correct name is *V. tomentosum* var. *dilatatum*. The other Japanese Snowball is a dwarf plant and blooms here about two weeks earlier than *V. plicatum*, and the correct name for it is *V. tomentosum* var. *dilatatum*, forma *rotundifolium*. The Chinese Snowball, *V. macrocephalum*, forma *sterile*, has pure white sterile flowers in larger heads than those of the other Snowballs. *V. Sieboldii*, a native of Japan, is a treelike shrub or small tree which sometimes grows to a height of thirty feet. It has light green, lustrous leaves round and broadest at the apex, with prominent veins, and when pressed a disagreeable odor. The flowers are produced in large clusters and the fruit, like that of *V. tomentosum*, turns from bright red to black after it is fully grown. *V. Sieboldii* is a fast-growing and perfectly hardy plant, and is one of the best of the Asiatic Viburnums in this climate. A handsomer plant, however, is *V. dilatatum* which is widely distributed in Japan and grows also in Korea and western China. It is a large and shapely shrub with broad flat clusters of perfect flowers which are followed by large clusters of small bright red fruits which make it a desirable plant for the decoration of autumn gardens. This is one of the last of the Asiatic species to flower in the Arboretum and will soon be covered with its handsome flower clusters. *V. burejaeticum* from eastern Siberia and *V. erosum*, a native of Japan and Korea, are also well established here but have little to recommend them as garden plants; and this is true of the six or seven species from western China discovered by Wilson which are hardy here. The best of them, perhaps, is *V. theiferum*, a stout and vigorous narrow shrub with erect stems, small flower clusters and red fruits. From an infusion of the leaves the "sweet tea" used by the monks in the monasteries on Mt. Omei, one of the five sacred mountains of China, is prepared. Of the western Chinese species *V. Veitchii* has perhaps the handsomest foliage which resembles that of the Traveler's Tree, *V. Lantana*, and retains its bright green color and does not fall until after that of all other Viburnums. *V. furcatum* from Japan and Korea is

closely related and resembles the North American Hobblebush or Moosewood, *V. alnifolium*, often called *V. lantanoides*.

Cornus kousa is a small tree which enlivens the forests of eastern Asia as *C. florida* enlivens those of eastern North America and *C. Nuttallii* those of western North America. These three species have the large white or creamy white bracts under the flower clusters which make the inflorescence so conspicuous, but the Asiatic tree differs from the American trees by the union of the fruit into a globose fleshy head while the fruits of the American trees are not united. This Asiatic species rarely exceeds twenty feet in height and the floral bracts are narrower, more pointed and not as pure white as those of the American trees. This native of central Japan is valuable, however, because it flowers three or four weeks later than *C. florida*. The best specimen in the Arboretum is flowering on the right hand side of the Centre Street Path and was raised from seeds produced in H. S. Hunnewell's garden at Wellesley. A handsomer tree is the Chinese form discovered by Wilson on the mountains of Hupeh in western China. The bracts under the flower clusters are broader than those of the Japanese form and overlap below the middle so that they form, like those of the American species, a cup on the end of a branch. This form is rare in cultivation, and the specimen among the Chinese plants at the base of Bussey Hill is probably the only large one in this country. It ripens a few seeds so that in time it may become valuable for general cultivation. It is interesting that in Massachusetts the Chinese and Japanese Flowering Dogwoods are hardier than the native species as the western American species cannot be grown here at all and the eastern species, *C. florida*, loses many of its flower-bracts in severe winters, and is often killed or injured here by extreme cold.

Dipelta floribunda, a shrub of the Honeysuckle Family, in habit not unlike some of the Diervillas, planted on Bussey Hill has not before flowered so well in the Arboretum. Seeds of this plant were first sent by Wilson to the Veitch Nursery in London in 1905 and a plant was presented to the Arboretum. This plant did not live here and the one now in bloom is one of those raised from the seed sent direct to the Arboretum by Wilson from China in 1910. This was killed to the ground during the winter of 1917; it produced shoots during the following summer and is now flowering profusely. Under favorable conditions plants sometimes grow from ten to sixteen feet high, with long, rather slender, at first puberulous branches with internodes generally shorter than the leaves. The leaves are opposite, without stipules, short-stemmed, thin, deciduous, lanceolate, ovate-lanceolate or oval, from two to four inches in length, acute or acuminate, rounded or cuneate at base, at first puberulous but soon glabrescent and rather paler below than above. The flowers, which are arranged in axillary tufts on short peduncles two-leaved and from three to six-flowered, are borne on slender, short, puberulous pedicels. The corolla, which is two-lipped and about an inch and a quarter in length, is pale rose color, tubular-inflated, the tube narrowed below the middle and cylindric; the lobes are nearly equal, round-oblong and spreading, the lower lip marked with orange lines.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 9

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JUNE 19, 1926

Rhododendrons. More money has been wasted probably in this country during the last fifty or sixty years in attempting to cultivate broad-leaved evergreen Rhododendrons, for which with few exceptions the climate is not really suited, than on any other plants. Among hundreds of species which have been discovered chiefly in southeastern Asia only nine are hardy here in New England; these are the eastern American *R. maximum*, *R. catawbiense*, *R. carolinianum*, and *R. minus*, the Caucasian *R. Smirnowii* and *R. caucasicum*, at least in some of its forms. *R. hirsutum* and *R. ferrugineum* from the mountains of central Europe sometimes grow here for several years but are usually short-lived in this climate. The Japanese *R. brachycarpum* has lived in Massachusetts gardens but is no longer in the Arboretum.

The plants which have been chiefly planted in New England gardens are English-made hybrids, hundreds of thousands of which having been imported. They are hybrids of *R. catawbiense*, most of which are made tender by the blood of Indian species with high-colored flowers. Even the few varieties of these hybrids which have proved hardy in Massachusetts are short-lived and not very satisfactory probably from the fact that they are grafted almost universally on *R. ponticum* which is not hardy in this climate. Even the two hybrids raised in England between *R. catawbiense* and *R. maximum*, called *R. delicatissimum* and *R. wellesleyanum*, are not always satisfactory or long-lived owing probably to the stock on which they are grafted in England.

In November, 1908, the Arboretum received from T. J. Seidel, in whose nursery near Dresden was one of the greatest collections of hardy Rhododendrons, a number of his catawbiense hybrids. Seidel

uses as stock for his hybrids one of the hybrids of *R. caucasicum* called Cunningham's White which was raised about 1830 by James Cunningham in his nursery near Edinburgh by crossing *R. caucasicum* with *R. ponticum.* This evidently makes a hardier stock than *R. ponticum* and is easily and cheaply cultivated from cuttings. The plants on this stock are dwarfer than those raised in England, and appear to be generally hardier. In the Seidel Collection in the Arboretum are the following named varieties: Adalbert, Adam, Alarich, Albert, Annedore, Anton, Arno, Attila, August, Bella, Bismarck, Calliope, Daisy, Desiderius, Diana, Donar, Echse, Eli, Eva, Fee and Viola. Of these Daisy with bright red flowers is the showiest and inclined to grow taller than the others. There is certainly no more beautiful Rhododendron in the Arboretum collection. In the future perhaps some American nurseryman will take up the propagation of these hybrids on stock of Cunningham's White or another of the Caucasian hybrids, but until this is done the cultivation of plants established in this country or of new collections of these plants is not promising, especially as the leaves of the evergreen Rhododendrons are seriously and now nearly universally attacked by the so-called lace-wing fly and it is necessary to spray the plants with some mineral oil at least two or three times every year.

Rhododendron Smirnowii. The fact that the leaves of this plant are covered below with pale felt, which protects them from the attacks of the lace-wing fly, makes the species particularly valuable, and much can be expected from it in this country. It has been growing in the Arboretum for several years and has not suffered from cold or drought, although when fully exposed to the sun the leaves often droop and their edges infold, and it is better in partial shade than in full sunlight. The flowers are of good size and of pleasant shades of pink or rose color, and are borne in large clusters. Several hybrids of *R. Smirnowii* with hybrids of *R. catawbiense* have been raised in Europe and there are a few of these in the Arboretum collection; they have proved to be good garden plants here, flowering earlier than *R. Smirnowii* and producing large pink flowers. They have never been injured in the Arboretum, but as there is only a trace of the felt left on their leaves they will probably suffer from the lace-wing fly. *R. Smirnowii* is now in full bloom.

Rhododendron carolinianum and *R. minus* are southern Appalachian species; the former is a dwarf compact shrub with leaves covered below more or less thickly with rusty brown scales, and compact clusters of small pure pink flowers which open in May; it grows equally well in full exposure to the sun and in the shade of Pines and other trees. There is a white-flowered form with thinner, rusty brown leaves which is still rare in gardens and appears to be less hardy than the pink-flowered type. *R. minus* grows at low elevations, as at the locks on the Savannah River above Augusta, Georgia, up to altitudes of thirty-five hundred feet on the Blue Ridge in North Carolina. It is a shrub sometimes ten or twelve feet tall, with leaves covered below with glandular scales and pink flowers which in Massachusetts open after the middle of June.

Some of the Rhododendrons which have proved hardy in the Arboretum appear to be hybrids of the pale yellow-flowered *R. caucasicum,* a shrub which grows at high altitudes on the mountains of the Caucasus

in Asia Minor. These hybrids, which have been grown successfully in the Arboretum, have compact clusters of flowers which open sometimes two or three weeks earlier than the catawbiense hybrids. There is much confusion in regard to the history of these plants and their breeding. The most satisfactory of them here is Boule de Neige. Judging by the name it was raised in France or Belgium. Only the name appears in the most elaborate work on Rhododendrons which has been published, and nothing now appears to be known about its breeding. It has white flowers faintly tinged with pink when they first open, and is one of the best Rhododendrons which can be planted in New England. Other good plants here of the Caucasian race are Mont Blanc, with deep rose-colored flower-buds and expanding flowers which soon become pure white; it is a taller and wider spreading plant than Boule de Neige; Sultana and Cassiope are dwarf, white-flowered plants of less vigorous growth and dwarfer habit than Mont Blanc. A plant of *R. coriaceum*, not rare in English nurseries, has been in the Arboretum for many years, and although it flowers a week or two earlier than the plants already mentioned it appears to be of Caucasian blood. Three dwarf hardy Rhododendrons were obtained many years ago in England by crossing the European species with a dwarf species of the southern Appalachian Mountains. The handsomest of them is perhaps *R. myrtifolium*, a hybrid between *R. minus* and *R. hirsutum*, which is covered every year in June with small clusters of pale rose-colored flowers. A hybrid between *R. ferrugineum* and *R. minus* has recently been distinguished as *R. laetevirens*, the name *Wilsonii* under which it has been growing in English nurseries properly belonging to another plant. The third of these hybrids, *R. arbutifolium*, is believed to be the result of crossing *R. carolinanum* with *R. ferrugineum*. The American parents are handsomer plants and better worth a place in the garden than these hybrids which have suffered from the influence of the European species.

In the Arboretum are several plants of the hybrid between *R. Metternichii* and a hybrid catawbiense raised by Anthony Waterer at Knap Hill. These plants have large, dark green leaves which are larger than those of *R. catawbiense* and of many of its hybrids, and flowers which vary on different individuals from pink to rose color. They are hardy and vigorous but the flowers are not superior to those of some of the hardy forms of the catawbiense hybrids.

The Japanese *R. brachycarpum* is a handsome shrub with leaves which resemble those of *R. catawbiense*, and compact clusters of large pale pink or pale straw-colored flowers. This species did not reach England, it is said, until 1888, although it was sent to the United States in 1862 by Dr. R. H. Hall, and flowered in Mr. Francis Parkman's garden a few years later. The original plant was presented by Mr. Parkman to the Arboretum where it bloomed for several years; it was finally lost in transplanting. This hardy Rhododendron, it is believed, will soon become common in gardens as Wilson sent large supplies of seeds from Japan.

Cornus controversa. This is a widely distributed tree in Japan, Korea and western China, and one of Wilson's photographs made in China shows a specimen sixty feet high with a trunk seven feet in girth.

This tree is now blooming in the Arboretum and the largest specimen is in the Peters' Hill Nursery. This plant came here in 1913 from the Park Department of the City of Rochester, New York, and is now about twenty-five feet high with a short trunk and a head twenty-six feet in diameter. The branches are long, crowded and spread at right angles with the stem, drooping slightly at the ends, the lowest sweeping the ground. The upper sides of the branchlets are thickly covered with flat flower clusters six or seven inches in diameter, and raised on erect stems. The flowers, which are white or white faintly tinged with yellow, are followed by black shining fruits which are eaten by the birds as fast as they ripen. As it grows on Peters' Hill it is a magnificent plant and the handsomest of the genus in the Arboretum with the exception of the species with white floral bracts. To the student of botanical geography *C. controversa* is interesting as another living witness of the relationship between the floras of eastern Asia and eastern North America, for in the genus Cornus with many species there are but two with alternate leaves, *C. controversa* in eastern Asia and *C. alternifolia* in eastern North America. Although this Asiatic species was growing in the Veitch Nursery near London as early as 1880, it has remained little known or understood in gardens owing to the confusion of this species with *C. macrophylla*, an eastern Asiatic tree with opposite leaves.

Kolkwitzia amabilis, the only representative of a genus of western China related to Diervilla and Abelia, is blooming well on the southern slope of Bussey Hill. The flowers are in pairs on long stems at the ends of short lateral branchlets, and rose color in the bud become paler after opening and are blotched with yellow at the base of the inner surface of the divisions of the lower lobe of the corolla. Kolkwitzia has not yet produced seeds in the Arboretum, but it can be propagated by cuttings and is now becoming more common in Long Island gardens than it is in the neighborhood of Boston. It is interesting that, judging from a photograph just received from Dr. Ridgway, it is growing and flowering better in his garden at Olney, Illinois, than it has in the east.

Hydrangea petiolaris. The specimen of this vine, the Japanese climbing Hydrangea, on the southeastern corner of the Administration Building is one of the great sights of the Arboretum at this season of the year when it is covered with flower clusters from the ground to the eaves of the building. The leaves of few plants unfold here as early in the spring, and there is only one other climbing plant with conspicuous flowers hardy here, *Schizophragma hydrangeoides*, able to attach itself to a brick or stone wall, and this blooms later. The flower clusters of the Climbing Hydrangea are surrounded by a circle of white sterile flowers from eight to ten inches in diameter; they are terminal on short lateral branches which stand out from the main stem of the plant and give it an irregular surface which adds to its beauty and interest. This plant was first raised at the Arboretum in 1878 and is now occasionally cultivated in this country. It might be better known and more generally used for there is no other plant so well suited to cover brick or stone walls of buildings in the northern United States.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 10

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JUNE 24, 1926

Philadelphus. Few plants give greater beauty to northern gardens than the Syringas or Mock Oranges. These are the unfortunate popular names of the different species of Philadelphus, for Syringa is the botanical name of the Lilac, and Mock Orange is the popular name of *Prunus caroliniana*, a southern evergreen Cherry which is much planted in the southern states as an ornamental tree and in making hedges. The species of Philadelphus grow naturally in southeastern Europe and the Caucasus, in the United States on the southern Appalachian Mountains, in western Texas, on the southern Rocky Mountains and in the northwestern states, in Japan, Korea, northern and western China, and on the Himalayas. In the last twenty years much attention has been paid to the introduction of new species; artificial and natural hybrids, too, have increased the number of these plants, and there are now growing in the Arboretum some thirty species and a number of varieties and hybrids. The flowering period of the Syringas extends through six or seven weeks and, with few exceptions, none of them begin to bloom until that of most Lilacs and of the Bush Honeysuckles has passed. With its development in recent years Philadelphus has become one of the important groups of garden shrubs to be ranked with the Lilacs, Bush Honeysuckles, Viburnums and Azaleas. The species and hybrids of Philadelphus are nearly all hardy in Massachusetts, but the white and usually fragrant flowers are their only attraction. They are not particularly interesting in habit; the foliage is dull; the leaves fall without change of color, and the fruit, which is a dry capsule, is smaller and not more attractive than that of the Lilac. All the Syringas flower freely nearly every year; they need rich, well-drained soil, and the

presence of lime in it has no bad effects on them. Better than most shrubs they can support shade and their ability to grow and flower under trees make them valuable as undergrowth in border plantations.

The Mock Orange of all old gardens is *Philadelphus coronarius*, the eastern European species. This plant was first cultivated in England before the end of the sixteenth century and was probably one of the first garden shrubs brought to America by the English settlers. It is a medium-sized shrub often as broad as high. The flowers, too, are of medium size and faintly tinged with yellow. This shrub has been somewhat neglected since so many species and hybrids with larger and showier flowers have found their way into gardens. This is unfortunate, for no other Syringa equals the old-fashioned Mock Orange in the delicate perfume of its flowers. Varieties of this plant with yellow flowers, with double flowers, and with narrow willow-like leaves can be seen in the Arboretum collection, but none of them have any particular decorative value. Among the American species which should find a place in all gardens are *P. inodorus*, *P. pubescens*, and *P. microphyllus*. The first is a native of the Appalachian Mountain region and grows to the height of six feet; it has arching branches and large, solitary, pure white, cup-shaped, scentless flowers. By some persons it is considered the most beautiful of all Syringas. *P. pubescens*, often called *P. grandiflorus* or *P. latifolius*, is also a plant of the southern Appalachian region. It often grows to the height of twenty feet; the branches are stout and erect; the leaves are broad, and the slightly fragrant flowers are arranged in erect, from five- to ten-flowered racemes. This plant is more common in gardens than the last and when it is in bloom it makes a great show. *P. microphyllus*, which rarely grows more than three feet tall, has slender stems, and leaves and flowers smaller than those of any Philadelphus in cultivation. What the flowers lack in size, however, is made up in fragrance which is stronger than that of any other Syringa and perfumes the air for a long distance.

The most distinct and the handsomest of the Asiatic species in the Arboretum is *Philadelphus purpurascens*, discovered by Wilson in western China. It is a large shrub with long arching stems from which rise numerous branchlets from four to six inches long and spreading at right angles; on these branchlets the flowers are borne on drooping stalks; they are an inch and a half long, with a bright purple calyx and pure white petals which do not spread as they do on most of the species but form a bell-shaped corolla and are exceedingly fragrant. This is one of the handsomest of the shrubs brought from western China to the Arboretum. *Philadelphus Magdalenae* is another Chinese species well worth cultivation. It is a tall broad shrub with arching stems, small dark green leaves and pure white fragrant flowers an inch and a quarter in diameter and arranged in drooping, leafy, many-flowered clusters from six to ten inches in length. *P. pekinensis* from northern China and Mongolia is a stout bush rather broader than high which every year produces great quantities of small flowers tinged with yellow. Another interesting garden plant, *P. Falconeri*, which is certainly Asiatic and probably Japanese, has narrow lanceolate leaves and fragrant flowers in from one- to six-flowered racemes, and is distinct in the shape of its leaves and in its long narrow petals. The

origin and history of this plant is not known.

Hybrid Philadelphus. The first hybrid Philadelphus which attracted attention was raised in France before 1870 by a Monsieur Billard, and is sometimes called in gardens Souvenir de Billard, although the correct name for it is *Philadelphus insignis.* This hybrid is one of the handsomest of all the tall-growing Syringas, and its value is increased by the fact that it is one of the latest of them all to flower. In a few old gardens in the neighborhood of Boston great Syringa bushes occasionally thirty feet high and correspondingly broad are sometimes found. These plants are believed to be hybrids between *P. coronarius* and some unrecognized species. It is called *Philadelphus maximus.* Another hybrid, *P. splendens,* sprang up in the Arboretum several years ago and is supposed to be a hybrid between two American species, *P. inodorus* and *P. pubescens.* It is a large and shapely shrub with pure white only slightly fragrant flowers an inch and three-quarters in diameter and borne in erect clusters. *P. splendens* flowers very freely and when the flowers are open it is the showiest plant in the Syringa Group.

Yellow-flowered Roses. Of Roses with yellow flowers there are only five species growing from the Caucasus to the Himalayas, in central Asia and in western and northern China. One of these, *R. simplicifolia,* from Persia is not hardy in New England. The first of the four species to bloom here, *R. Hugonis* from western China, perhaps the handsomest Rose which is hardy in this climate, has been described in earlier Bulletins and is already out of bloom. The next of these four species to bloom here, *R. Ecae,* is a spiny shrub with small leaves and pale yellow flowers not more than an inch in diameter. It is a native of Afghanistan where it is common on mountain ridges and at Samarkand, and although of some botanical interest it has little to recommend it as a garden plant in this region. It is very hardy, however, grows into a large plant and flowers freely. In 1820 an English botanist found in a collection of Chinese drawings in London the picture of a double yellow Rose to which he gave the name of *R. xanthina,* and many years later the single-flowered form of this Rose was found growing wild in Mongolia by the French missionary David. Often confused, especially in Europe, with *R. Ecae* it apparently was not cultivated in the United States until 1908 when the Arboretum received from the Department of Agriculture seeds of this Rose gathered in China by its collector, Mr. F. N. Meyer. Both forms are in bloom in the Arboretum and are much cultivated in the gardens of Peking. The last of the hardy yellow-flowered Roses, the so-called Austrian Briar, has suffered from too many names, the oldest of which must be adopted for it, *R. foetida,* is unfortunate as the flowers have a slight odor which some persons do not find pleasant. Although long known in gardens as the Austrian Briar, it is probably nowhere a native of western Europe but an inhabitant of the Crimea, the Caucasus, Persia, and probably central Asia. It has handsome bright yellow flowers and when it grows well is one of the most beautiful of all single-flowered Roses, but in this climate the plants are usually short-lived. The Copper Austrian Briar, which has petals yellow on the outer surface and dark

copper color on the inner surface, is believed to be a variety of *R. foetida* (var. *bicolor*). There is a double-flowered variety of *R. foetida* in the collection (var. *persiana*), known as the Persian Yellow Rose. This plant was sent from Persia in 1838 and is sometimes cultivated in American gardens.

Scotch Roses. The Burnet or Scotch Rose, *Rosa spinosissima*, with its prickly stems, small leaves, bright flowers and globular black fruits can be found in most old-fashioned northern gardens. It is a very hardy plant, resistant to abuse, and handsome when its spreading branches are covered with flowers which unfortunately last for a short time. A variety of this plant from Siberia (var. *altaica* or *grandiflora*) is a larger plant and one of the handsomest of all single-flowered Roses which can be grown in this climate where it sometimes makes a dense bush six or seven feet high and broad; it produces great numbers of suckers by which it can be easily increased. The variety *hispida* is a taller growing plant with erect stems and yellow flowers from two and a half to three inches in diameter. Var. *fulgens* has pale pink flowers and the variety *luteola* pale yellow flowers. From the garden of the Duke of Buccleuch at Dalkeith, near Edinburgh, the Arboretum received a few years ago a collection of Scotch Roses for which this garden was once famous. One of the plants in this collection called Jupiter has pale pink single flowers, and another called Lady Baillie has small pale yellow flowers; they are both attractive plants and worth attention. Harison's Yellow Rose, which was raised by Mr. George Harison of New York about 1830, believed to be a hybrid between the Scotch Rose and the Austrian Briar, is a very hardy, free-growing and vigorous plant, and never fails to produce large crops of yellow semi-double flowers. At one time it was a very popular plant in northern gardens, and is still found in most old-fashioned gardens.

Deutzia hypoglauca. This is a tall, hardy vigorous shrub with erect, much-branched stems, lanceolate, long-pointed leaves dark yellow-green on the upper surface and pale below, and light orange-brown branchlets. The pure white flowers are seven-eighths of an inch in diameter and are borne on slender drooping pedicels in many-flowered compound, round-topped clusters from three to four inches across. The broad, petal-like filaments, which are rather shorter than the spreading petals and are notched at the apex, form a tube rising from the center of the flower from which the bright yellow anthers emerge. The plants in the Arboretum were raised here from seeds collected in 1910 by Purdom on the mountains of Shensi at altitudes between eight and ten thousand feet above the sea-level. This may prove a valuable plant to cross with some of the Chinese Deutzias with rose-colored flowers which are not really hardy in this climate. It is a handsomer plant than *D. parviflora*, another Chinese species, and an old inhabitant of the Arboretum where it has proved to be one of the hardiest of all Deutzias. Sent by the Arboretum to Lemoine at Nancy, France, it was successfully crossed by him with *D. gracilis*. The result of this cross was *Deutzia Lemoinei*, one of the handsomest and hardiest garden shrubs of recent creation.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 11

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JUNE 30, 1926

The Arboretum early in July. The Arboretum at this time is not devoid of many conspicuous flowers, but for many persons its greatest beauty and interest is now found in the early summer foliage of its trees and other plants, its variety and various combinations. Thanks to the cool spring and often abundant rains, the foliage in the Arboretum has never been more luxurious, and the leaves on most of the Arboretum plants have rarely been so free of disease and disfiguring insects. There is certainly no other place where the maker of parks in the northeastern United States and in eastern British America can see such a variety of plants or learn how to use them to the best advantage in his work.

Cornus amomum. Attention is called again to the Silky Cornel because it is one of the best of all shrubs to plant in this climate near the banks of streams and ponds where a large mass of foliage to spread out over the surface of water is desired. Examples of this use of this shrub can now be seen at two of the small ponds near the end of the Meadow Road where this Cornel is now covered with flowers. These will be followed in autumn by bright blue fruit; in the winter the purple stems are attractive. The Silky Cornel is a good plant, too, to place in front of groups of trees and shrubs, but it must have room for the free growth of its wide-spreading branches, for when crowded by other plants the branches become erect, and all the character and beauty of the plant is lost. A space of not less than twenty feet in diameter is necessary for the development of a handsome plant of the Silky Cornel.

Rosa rugosa. This is a native of the coast sand-dunes of northeastern Asia from northern Japan to Kamtchatka, and is an old inhabitant of gardens. The thick dark green leaves seem able to resist the attacks of insects and the diseases which often discolor the leaves of many Roses. The flowers of the typical wild plant from Japan are red, but there are varieties with pure white and with clear pink flowers. The Kamtchakta plant, which is less ornamental than the Japanese plant, with smaller and thinner leaflets and smaller flowers is treated by many botanists as a species distinct from the Japanese plant and called by them *Rosa kamtschatica.* There is a double-flowered form of this continental plant in the Arboretum collection which produces flowers which are as ugly as it is possible that a Rose flower can become. No other Rose is hardier than *Rosa rugosa,* and left to itself it spreads into great thickets. No shrub is better suited to grow in exposed positions on the New England coast; it grows equally well in the rich soil of the garden, and no other Rose is so valuable in this climate for making low hedges. Valuable as the Japanese *Rosa rugosa* has proved itself as a garden plant its greatest value is in its ability to transmit its hardiness, handsome foliage and large flowers to its hybrid offspring. Among these are already several beautiful garden plants which suggest that the plant breeder who wishes to produce new races of Roses able to grow and flower successfully in the northern states must combine *Rosa rugosa* and its hybrids with other hardy Roses. Rose breeders are singularly reticent about the plants they have used in their work, and there appear to be no printed records of the parentage of any of the Rugosa hybrids with the exception of the two which have been created in this Arboretum. One of the earliest of the Rugosa hybrids, Madame Georges Bruant, has pure white, semidouble flowers which continue to open until the coming of frost. More distinct is the plant named Conrad Ferdinand Meyer which was raised in Germany. This is a large shrub, with large, nearly double, clustered pink flowers. The foliage and flowers show little Rugosa influence, but its vigor and hardiness are probably derived from the Japanese parent. Blanc de Coubert is a handsome, double-flowered form. At least twenty other European hybrids of *Rosa rugosa* have received names. Roserie de la Hay is one of the handsomest of the hybrid dark red Roses. Another of the handsomest and most distinct of these hybrids was raised several years ago by Paul & Sons of Cheshunt, England, by whom it was named *Rosa rugosa repens alba.* This plant has the foliage of *Rosa rugosa,* large flowers with petals between which there is more space than in the typical flowers of *Rosa rugosa,* and long, stout, prostrate stems. In England standards with weeping branches have been successfully grown by budding this Rose on the tall stems of other Roses, and it would probably prove one of the hardiest standard Roses which could be grown here. It can be trained over a fence or arbor, but can be best used to cover banks and the ground under other shrubs or small trees. The Japanese *Rosa Wichuraiana* was at one time largely used as a ground cover in the Boston Parks, but it has not always proved hardy, and *Rosa rugosa repens alba* is a better ground cover in this climate. This Rose has been growing in the Arboretum for several years and has now been planted on the fence close to the entrance to the Arboretum nursery on Prince Street. The two Rugosa hybrids

raised by Dawson at the Arboretum have proved to be good garden plants. In habit Lady Duncan resembles *R. rugosa repens alba* but the stems are not as stout; it can be used as ground cover or trained on an arbor or trellis. The flowers are rather smaller than those of *R. rugosa* and pure pink, and the leaflets are smaller and very lustrous. This Rose was obtained by crossing *R. rugosa* and *R. Wichuraiana*. The Arnold Rose, *R. arnoldiana*, was made by Dawson who crossed *R. rugosa* with the hybrid Tea Rose, General Jacqueminot. It is a stout bush with good foliage and large, bright red, single flowers, and when in bloom perhaps the showiest of the Roses in the Shrub Collection.

Rosa multiflora cathayensis. In 1804 a Rose reached England from China and when it flowered was found to have small, clustered, double pink flowers. It soon found its way to France and in 1821 received the name of *R. multiflora carnea*. Redouté made it the subject of one of his graceful Rose portraits in *Les Roses*, the most beautiful of the many books devoted to Roses. In 1817 another of the double red or pink-flowered *multiflora* Roses was sent from China to England and then to France. This plant received there the name of *Rosa multiflora platyphylla* and its portrait was also painted by Redouté. It was called in England the "Seven Sisters Rose" and soon became a popular garden plant in Europe and the United States. Now it has almost disappeared from gardens, having been replaced by the Rambler Roses of more recent introduction. The Crimson Rambler Rose, which is now one of the most popular Roses in the northern United States, is evidently a selected form of *R. multiflora platyphylla* and has been widely cultivated in China probably for centuries. From China it reached Japan, and in 1878 came from Japan to England. *Rosa multiflora* itself, which is a Japanese species with large clusters of small white single flowers, has been known to botanists since 1784 but did not reach England until about 1875. Seeds of this Rose were sent, however, from Germany a year earlier to the Arboretum where it has been largely used in the production of hybrid Rambler Roses. Nothing was known of the origin of the double pink and red-flowered Chinese *multiflora* Roses until 1897 when a French missionary, the Abbé Farges, sent from western China to Monsieur Maurice L. de Vilmorin seeds of a Rose which turned out to be a single pink-flowered *R. multiflora*, and certainly the plant from which they had been derived. A portrait of this plant in flower appeared in 1904 in the catalogue of the Fruticetum Vilmorinianum, but it was not named and seems to have been lost sight of. Wilson found it in western China, where it is very common, and collected seeds. William Purdom, also collecting for the Arboretum in Shensi in 1909, sent seeds here of this single-flowered Rose and the plants raised from these seeds are now flowering in the Arboretum for the third year. This Rose is now to be called *R. multiflora* var. *cathayensis*; it is a hardy, vigorous, and handsome plant with the habit of the Japanese *R. multiflora*. The flowers are from two to two and a half inches in diameter, and are produced in large, many-flowered clusters, and the large, conspicuous, bright yellow anthers add to the beauty of the clear pink petals. This Rose may well become a popular garden plant. It offers possibilities which the hybridist will undoubtedly take advantage of; and it is of considerable historical interest as the wild original of gar-

den plants cultivated probably for centuries by the Chinese and known in Europe and America for more than a hundred years. Plants covered with flowers and flower-buds can be seen with the other Chinese Roses in the Chinese Shrub Collection on the southern slope of Bussey Hill.

The Boursault Rose (*Rosa Lheritieranea*) is now covered with flowers. This Rose, which was raised in France early in the last century, is believed to be a hybrid of *R. chinensis* and the European *R. pendulina*. It owes its popular name to Monsieur Boursault who one hundred years ago had a garden in the Rue Blanche, now the Chausée d'Antin, famous for its collection of Roses. There have been several forms of the Boursault Rose but the one in the Arboretum collection, which has pale rose red, partly double flowers, was not formerly an uncommon plant in old New England gardens. It is a tall, vigorous and perfectly hardy shrub with gracefully spreading stems, and is well worth more common cultivation.

Rosa caudata was discovered by Wilson in western China and is one of the Cinnamomae section of the genus; it is a tall vigorous shrub with stout arching stems covered not very thickly with stout spines, dark green foliage, and flowers about two inches in diameter, in wide, sometimes twenty-five-flowered clusters. The beauty of the flowers is increased by the white markings at the base of the pure pink petals. The fruit is orange-red, an inch long, gradually contracted above into a narrow neck crowned by the much enlarged calyx-lobes. This handsome Rose is perfectly hardy and an excellent addition to the Roses of its class.

Rosa bella was introduced into the Arboretum from northern China and is a tall stout shrub which produces every year at the end of June great numbers of large rose-red flowers followed by showy fruits. A good garden plant for cold countries, *R. bella* might in the hands of a skilful plant breeder have a useful influence in a new race of hardy Roses.

Potentilla tridentata is a native of eastern North America, where, especially on the coast, it is common in rocky and exposed situations. The leaves are composed of three leaflets which are dark green and very lustrous, and the small white flowers are produced in several clusters standing well up above the plant on long stems. It is well established in the Shrub Collection, and there is a larger mass of it on Azalea Path on Bussey Hill which is now covered with flowers.

The handsomest plant now in bloom in the Arboretum is the Chinese form of *Cornus kousa* on the eastern slope of Bussey Hill. It has been mentioned in a recent number of these Bulletins but not half enough has been said about it, and it is doubtful if a more beautiful plant has ever come from eastern Asia to the eastern United States. It will repay a visit just now by all plant lovers.

Laurel (*Kalmia latifolia*). Visitors to the Arboretum this year will lose its greatest flower show which for the last quarter of a century has been made every year by the long bank of Kalmias along the road at the northern base of Hemlock Hill. The plants are in good health and are beginning to make a vigorous growth, but on a very few of them are only occasional flowers. This failure to bloom has not happened here before and can only be accounted for by the fact that last year they were unusually full of flowers.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 12

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JULY 10, 1926

Tsuga caroliniana. The Carolina Hemlock as it grows in the Arboretum is generally considered the most graceful and beautiful cone-bearing tree in the collection. It is a native of the Blue Ridge, the eastern range of the Appalachian Mountains on which it grows from southwestern Virginia to northern Georgia usually in scattered groves on the rocky banks of streams generally at elevations between two thousand five hundred and three thousand feet. It escaped the attention of the numerous botanists who explored the southern Appalachian Mountains during the last half of the eighteenth and the first half of the nineteenth century, and its distinct character was first noticed in 1850 by Dr. L. B. Gibbes, of Charleston, South Carolina, although it was not until thirty-one years later that it was described by Dr. Engelmann. This Hemlock was first raised at the Arboretum in 1880 and the tallest tree here is now nearly forty feet high. On the Blue Ridge the Carolina Hemlock is usually not more than forty or fifty feet high, although occasionally trees up to seventy feet in height occur, and the trunk has rarely a greater diameter than two feet. It is a much smaller tree therefore than the northern Hemlock. The branches are more pendulous and the leaves are darker green and more lustrous than those of this tree. The leaves, too, are usually notched at the apex and slightly toothed, while those of the northern tree are usually rounded at the apex and not toothed. The two trees are, however, best distinguished by their cones; those of the southern tree are not stalked and their scales are much longer than broad with obtusely pointed bracts; and those of the northern tree are stalked, and the scales are about as long as wide with bracts broad and truncate at the apex.

Many persons see and admire the Carolina Hemlock in the Arboretum every year, but it is still rare in cultivation, and probably ten thousand Colorado Blue Spruces (*Picea pungens*) are planted in this country every year for one Carolina Hemlock. Among a large number of seedlings of the Carolina Hemlock raised at the Arboretum in 1881 two individuals are dwarf in habit. They show no tendency to form a leader and look as if they would continue to grow more rapidly in breadth than in height. In their gracefully drooping branches they are more beautiful even than the dwarf *Tsuga canadensis* which has usually been considered the handsomest of dwarf conifers.

Cladrastis. For more than a century the American Yellow Wood (*Cladrastis lutea*), one of the most beautiful trees when in flower of the North American forest, was supposed to be the only representative of this genus of the Pea Family, but in 1890 another species (*C. sinensis*) was found in the forests of western Szechuan and in 1901 Wilson discovered it in western Hupeh while collecting for the Veitches of London, by whom a plant was sent to the Arboretum in 1910. This plant has proved perfectly hardy and began to flower a few years ago, but it has never bloomed so abundantly as it has this season. Not as beautiful as the American species, it is of extreme interest as another important connection between the floras of eastern North America and eastern Asia.

Cladrastis sinensis in its native forests is sometimes a tree eighty feet high, with leaves composed of from nine to thirteen oblong to oblong-lanceolate leaflets usually rounded at the base, yellowish green, pubescent on the lower surface along the midrib, and from two to four inches in length, with a pubescent rachis and petiole. The flowers are produced in loose, upright, much-branched, nearly erect panicles from five to twelve inches long and from four to eight inches in diameter, and are white or white slightly tinged with pink and about half an inch long. This appears to have remained an extremely rare tree in cultivation, especially in the United States. Later another species was discovered in Hupeh (*C. Wilsonii*) which probably is not in cultivation.

Lemoine Hybrid Philadelphus. Several years ago the French plant breeder Lemoine crossed *Philadelphus coronarius* with the Rocky Mountain *P. microphyllus* and obtained an entirely new race to which the general name of *Philadelphus Lemoinei* was given. The original bush is intermediate between the parents in size and in the size of the flowers. The flowers are pure white, very fragrant and produced in profusion. From this plant Lemoine raised many seedlings and secondary hybrids, and these vary from the original *P. Lemoinei* in size and in the size and shape of the flowers. Taken as a whole the Lemoine hybrid Philadelphus form one of the most beautiful groups of garden plants that has been created by man. There are a number of these plants in the Arboretum collection and they have been considered perfectly hardy here, but they are sometimes injured in severe winters. *P. Lemoinei* itself and many of its varieties are uninjured, but a few of the second hybrids have been killed to the ground but are now growing again from the roots.

The last of the Azaleas. As the yellow or flame-colored flowers of *Rhododendron calendulaceum* fade those of another Appalachian species, *R. arborescens*, begin to open. The deliciously fragrant flowers are white with bright red stamens and style, and do not open until after the leaves have grown nearly to their full size. The home of this plant is on the Appalachian Mountains on which it is found from western Pennsylvania to northern Georgia, in the neighborhood of streams in the rich soil of sheltered valleys growing to the height of fifteen or twenty feet. On the Carolina Mountains it is often not more than three or four feet tall, forming at altitudes of about five thousand feet above the sea great thickets often acres in extent. Its value as a garden plant is not generally understood or appreciated. The flowers vary greatly in size and in the length and diameter of the corolla-tube, and although the corolla is generally pure white a form is now known in which it is suffused with rose (var. *Richardsonii*), in another it is more or less striped with rose, in another tinged more or less deeply with yellow, and in another it is marked with a yellow blotch. All these forms are well worth a place in a collection of Azaleas, and it is possible that if seedlings were raised perhaps more varied and distinct forms might occur among them. There is a group of this Azalea on the Valley Road in front of the Linden Group and another on the opposite side of this road. A mass of the plant, too, has been planted on the western slope of Azalea Path. The last of the Azaleas, *R. viscosum*, begins to open its flowers a few days later than those of *R. arborescens*; they are white and more fragrant than those of *R. arborescens* with a long slender corolla-tube. There is also a form on which the flowers are tinged with rose-purple. The clammy Azalea, or Honeysuckle, as it is called in this country, is an inhabitant of swamps and is common in the Cape region of Massachusetts and southward. In cultivation it grows as freely and flowers as abundantly on dry hillsides as it does in its native swamps, and masses of it on the lower side of Azalea Path are now covered with opening flower-buds.

Viburnum Canbyi. This is the last of the Viburnums to blossom in the Arboretum where its flowers are just opening. It is a native of eastern Pennsylvania and of Delaware, and has recently been found in Indiana; it is the largest and handsomest of the blue-fruited American species of which *V. dentatum* is the best known. It is a plant which is improved by cultivation, and there are great round-topped specimens in the Arboretum twelve or fifteen feet high and broad, and splendid objects at all seasons. Such plants can be seen on the right hand side of the entrance to the Administration Building and on the Meadow Road. The earliest Viburnum, *V. alnifolium*, flowered here the first of May, and from that day to this Viburnums have been flowering in the Arboretum.

Sambucus canadensis. This is the last of the native shrubs to make a conspicuous show of flowers in the Arboretum, and as the corollas of the late Viburnums begin to fall the wide, flower-like clusters of *S. canadensis* begin to whiten. Few native shrubs make a greater showing of flowers snd fruits, and the numerous Elders sown by birds on the banks of Bussey Brook in the valley north of Hemlock Hill,

and by the little ponds near the junction of the Meadow and Bussey Hill Roads add much to the beauty of the Arboretum in July. Growing with *S. canadensis* in the Shrub Collection is a form with leaflets deeply divided into narrow segments (var. *acutiloba*) and more curious than beautiful. There are here also a form with yellow fruit (var. *chlorocarpa*) and var. *maxima* which originated a few years ago in a European nursery and which has flower-clusters three times as large as those of the wild plant and such large and heavy bunches of fruit that the branches can hardly support them. A variety with yellow leaves (var. *aurea*) is also in the collection. More objectionable than many yellow-leaved shrubs because it is hardier and grows more rapidly to a larger size than some of them, this plant now disfigures many European gardens and is too often seen in those of this country.

Schizophragma hydrangeoides, now that it has at last, after more than forty years of failure, found a place that suits it on the east side of the Administration Building, is growing rapidly and promises to cover as much space as the great plant of the Japanese Climbing Hydrangea which is its neighbor. It is already half way to the top of the building, and its value as a flowering plant in July is now shown by its conspicuous flower clusters. The leaves are smaller than those of the Climbing Hydrangea, more circular in shape, more coarsely toothed and darker and duller in color. The inflorescence, which is terminal on short, lateral branchlets, which stand out from the stems, is interesting but not perhaps as showy as that of the Hydrangea, for instead of the surrounding ring of neutral flowers there are only two neutral flowers to each of the divisions to the large compound cluster of perfect flowers; these neutral flowers are snow white, ovate, often an inch or more long, and hang on long slender stems an inch in length. *S. hydrangeoides* seems to be a rare plant in American and European gardens, and in this country *Hydrangea petiolaris* is often sold for it.

Roadside Plants. Much attention has been paid here for several years in experimenting to secure the best plants to occupy the narrow beds between the driveways and the gravel paths which follow them, and thus far the most satisfactory plant found for this purpose has been *Rosa virginiana*, often called *R. lucida*, the seashore Rose of New England, an upright shrub from two to three feet in height which is covered with leaves, lustrous in the spring and turning yellow late in October. A plant which came here many years ago from Mt. Desert Island on the coast of Maine, and now distinguished as var. *lamprophylla*, is a handsomer plant than the typical form, of denser habit and with darker green lustrous leaves. The large pink flowers and the showy red hips are similar to those of the common form. Another plant which has been most successfully used for this purpose is the Fragrant Sumach (*Rhus canadensis*). This is a widely distributed North American shrub which rarely grows more than five feet tall, and when planted in good soil is often broader than high with lower branches spreading flat on the ground and upper branches erect, spreading or drooping. In early spring before the leaves appear the branches are covered with clusters of small bright yellow flowers which in June are followed by dull red fruits which are much hidden by the small compound leaves.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 13

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN OF POPULAR INFORMATION

JAMAICA PLAIN, MASS. JULY 16, 1926

Magnolia virginiana. This tree, better known perhaps as *Magnolia glauca*, is now in full bloom in the Magnolia Group on the right hand side of the Jamaica Plain entrance to the Arboretum, and has already been mentioned this year in a previous Bulletin. Its value as a garden plant in this climate, however, cannot be too often insisted on or its rarity in American gardens too often vigorously deplored. No one certainly can deny that it is the most beautiful shrub or small tree which is native to New England, and yet there is hardly an American nursery now from which it can be obtained. In this climate it is sometimes a slender tree thirty feet high with a trunk rarely more than twenty inches in diameter, with small, erect, ultimately spreading branches and slender bright green branchlets always pubescent when they first appear, soon becoming glabrous and marked by narrow, horizontal, pale lenticles gradually turning bright red brown in their second summer; often, however, growing as a shrub not more than ten or twelve feet high. The winter-buds are covered with fine silky pubescence, the terminal being from half an inch to three-quarters of an inch in length. At the north *M. virginiana* is found in deep swamps, its most northern station being near Magnolia in Essex County, Massachusetts. It grows also on Long Island, New York, and southward from New Jersey generally in the neighborhood of the coast to southeastern Virginia and rarely North and South Carolina. In Pennsylvania it ranges as far west as the neighborhood of Chambersburg in Franklin County. In the southern states it is usually replaced by the variety *australis* which differs in the thick silky pubescence on the pedicels and branchlets, and in the leaves which are persistent without change

of color until spring. This is a tree sometimes ninety feet in height with a tall straight trunk occasionally three feet in diameter and short branches forming a narrow round-topped head, and branchlets usually becoming glabrous in their second year. This beautiful tree, which of course is not hardy in New England, is found on the borders of pine barren ponds, in shallow swamps and on rich hummocks usually in the neighborhood of the coast from the lower Cape Fear River near Wilmington, Delaware, to southern Florida. It is common in the interior of the Florida peninsula and ranges westward to the valley of the Nueces River, Tennessee, and to Alabama, northern Mississippi and Louisiana. *Magnolia major* or *Thompsoniana*, which is a probable hybrid between *M. virginiana* and another North American species, *M. tripetala*, was raised in an English nursery more than a century ago and is still sometimes found in gardens and is intermediate in character between its parents.

Catalpas are trees of the Bignonia Family and grow naturally only in eastern North America, the West Indies and northern and central China. They all have large simple leaves and large terminal clusters of two-lipped flowers followed by long slender pods containing many thin seeds furnished at the ends with long tufts of pale hairs. All the Catalpas and one or two of their hybrids are growing in the Arboretum with the exception of the species from the West Indies. The first Catalpa, *C. bignonioides*, which attracted the attention of botanists and gardeners was sent from South Carolina to England early in the eighteenth century. This for a long time was the only American species cultivated in Europe or the United States, but forty or fifty years ago it became known that another species grew in the valley of the Ohio River and southward along the Mississippi River as far south as western Tennessee and northeastern Arkansas. To this Catalpa the name *speciosa* has been well given as it is now known to be the largest, the hardiest and the handsomest of all Catalpa trees. It is the earliest of all the species, too, to bloom, and it is now covered with flowers which are larger than those of the other species. On the rich alluvial bottom lands of the Mississippi River this tree has often grown to the height of one hundred and twenty feet and formed a trunk four and a half feet in diameter. In New England it will never grow to that size, but although it was introduced into the eastern states less than fifty years ago trees in eastern Massachusetts are already forty feet high and have been flowering and ripening their seeds for many years. Catalpas produce soft wood which is remarkably durable when it comes in contact with the soil, and in some of the middle western states large plantings of *Catalpa speciosa* have been made to supply fence-posts, for which the wood is admirably suited, and railway ties for which it has proved too soft. The other American species, *Catalpa bignonioides*, probably originated somewhere in the southeastern part of the country, but it has been so spread by escapes from planted trees that it is no longer possible to determine the location of its first home. It was for many years one of the common planted trees in the middle and southern states, and specimens are still occasionally seen in southern New England. Now, however, when one wants to plant a Catalpa tree in this country he finds in nurseries only *C. speciosa*. The more southern species is a smaller tree with shorter-pointed leaves; it grows

less rapidly and blooms two or three weeks later than the eastern species. The flowers are smaller, in shorter and more compact clusters, and the pods are smaller with thicker walls. There is a dwarf form of *C. bignonioides* (var. *nana*) which grafted on the stem of one of the tree Catalpas has in recent years been largely planted in this country for the supposed decoration of gardens which are more or less formal in character. It is not known where the dwarf form originated, and if it has ever flowered the fact is not known at the Arboretum. The fact that it is universally sold in American nurseries under the name of *Catalpa Bungei* causes confusion for that name properly belongs to a tree from northerh China. This Chinese tree has narrow, long-pointed, dark green leaves, small yellowish flowers and small pods. It has been growing in the Arboretum since 1904, and was perfectly hardy until the winter of 1916–17 when one of the trees was killed to the ground and others were more or less injured. They have now recovered, but this Catalpa has not yet flowered in the Arboretum. Compared with the American species it has no value as an ornamental tree. Another Chinese species, *Catalpa ovata*, was sent many years ago to this country from Japan where it has long been cultivated. It is a small tree with comparatively small, dark green leaves, many-flowered clusters of small, yellowish spotted flowers, and slender pods. This tree, which will grow in regions too cold for the American species, has been somewhat planted in the United States, although as an ornamental tree it does not have much to recommend it. In this country it has proved most valuable as one of the parents of the natural lhybrid, *Catalpa hybrida*, which appeared several years ago in the Teas Nursery at Baysville, Indiana, and is often called *C. Teasii* and Teas Hybrid Catalpa. This is a fast growing and hardy tree with flowers like those of *C. bignonioides*, the American parent, although smaller but in larger clusters, and leaves in shape resembling those of *C. ovata*. One of two species introduced by Wilson from central China, *C. Fargesii*, is still living but gives little promise of ever becoming a valuable addition to the number of summer flowering trees which can be successfully used for the decoration of New England gardens.

Oxydendrum arboreum, the Sorrel-tree or Sour Wood, is a native of the southern Appalachian mountain forests and the only tree of the Heath Family which can be grown in this climate, with the exception of the Laurel (*Kalmia latifolia*) and the Rose Bay (*Rhododendron maximum*) which are shrubs at the north and only exceptionally trees in a few favored valleys of the southern mountains. The Sorrel-tree in its native forests grows fifty or sixty feet high, but at the north as it begins to flower abundantly when only a few feet tall it is not probable that in this climate it will ever attain a considerable size. It is well worth growing, however, for its bright green shining leaves which have a pleasant acidulous flavor and in autumn turn bright scarlet, for its white Andromeda-like flowers erect on the branches of spreading or slightly drooping terminal clusters, and for its pale fruit which in the autumn are conspicuous among the brilliant leaves. There is a group of these plants among the Laurels at the northern base of Hemlock Hill which will flower at the end of July or early in August.

Evonymus radicans is the only evergreen climbing plant really hardy in this climate which can attach itself firmly to stone, brick or concrete walls. There are a number of varieties of this variable plant in cultivation, and the handsomest of them is the broad-leafed form from northern Japan, known as var. *vegetus*. This plant can grow in Massachusetts to the eaves of a tall house and completely clothe its walls with a cover which grows thicker by an annual shortening of the branches, or if a wall is not provided for it to cling to it will grow as a low, round-topped, dense shrub. Like the other forms of the species it can also be used to cover the ground under trees and shrubs, but as a ground cover it is improved by occasional clipping. The variety *vegetus* is now covered with its small yellow green flowers which will be followed by abundant pink fruits, which add greatly to the decorative value of this variety which is the only form of *E. radicans* which has flowered in the Arboretum. Extreme cold in occasional winters has injured the leaves on many plants of the variety *vegetus* in eastern Massachusetts, but the buds were not hurt and the branches were soon covered with a new crop of leaves.

Genista tinctoria. Of the small, yellow-flowered shrubs of the Pea Family, which are such a feature of the flora of southern and southeastern Europe and are so highly valued in the gardens of western Europe, the best known in Massachusetts is the Woad Wax, *Genista tinctoria*. Brought early from England as a garden plant it long ago escaped from a Salem garden and has spread over and ruined hundreds of acres in Essex County. Planted in the Arboretum it has spread among the native plants like dwarf Roses and Goldenrods which form a considerable part of the ground cover among the Hickories and Oaks, and now enlivens the valley through which the Valley Road extends from Centre to South Street. There is a taller variety with larger flowers (var. *elatior*). Much more beautiful and the handsomest of these plants which have been tried here is *Cytisus nigricans*, a native of Italy, Austria and Hungary, and now in bloom in the Shrub Collection. No small plant now in the Arboretum is more distinct and beautiful. As it grows here it is a compact, round-topped bush from two to three feet tall and broad, differing from most of the related plants in the arrangement of the flowers which are borne in long erect racemes terminal on branches of the year; they are bright yellow and produced in great profusion.

Helianthemum. A collection of the varieties of *Helianthemum nummularium*, better known perhaps as *H. chamaecistus* or *H. vulgare*, has been established in one of the borders on the western slope of Bussey Hill and is flowering well this year. These are half evergreen or evergreen, low, prostrate shrubs with leaves green on both surfaces, hairy or nearly glabrous, and from half an inch to an inch and a half in length, and flowers normally yellow but varying from rose pink, orange or white, and about an inch in diameter in many-flowered loose racemes. This species is a native of Europe, western Asia and northern Africa, and perhaps not as often cultivated as it should be in this country where low plants are needed to cover the ground among shrubs. The curious fact about it is that the flowers are only open before noon and close entirely in the afternoon.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 14

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN OF POPULAR INFORMATION

JAMAICA PLAIN, MASS. JULY 23, 1926

The Lindens. On the whole the group of Lindens on the right hand side of the Meadow Road is the best arranged and most satisfactory group of trees in the Arboretum, and so far as flowers are concerned these are the most interesting trees in this climate in July. Linden trees are found in eastern North America, eastern Asia, the Caucasus and in Europe, and the species are usually widely distributed and common forest trees. They are all quite similar in the character of their flowers and fruit, and chiefly differ in the shape of their leaves, in the presence or absence of the hairs on the leaves and branchlets, and in the nature of this hairy covering when it exists. A curious fact about Linden trees is that in the flowers of the American species there are five petal-like scales opposite the petals and connected with the clusters of stamens, and that in the flowers of the Old World Linden trees these petal-like scales do not occur. Another interesting fact which has been learned here about Linden trees is that in the Arboretum the European species and their hybrids are more vigorous and handsomer trees than the Asiatic species, although with few other exceptions eastern Asiatic trees give more satisfaction in eastern North America than the trees of western Europe. The European Lindens, too, grow more rapidly than the American species which have never been very generally planted in this part of the country with the exception perhaps of the northern *Tilia glabra* which often suffers here in dry summers from the attacks of the red spider which disfigures and often causes the leaves to fall in August, especially when planted as a street tree. This tree usually appears in books under the incorrect name of *Tilia americana*. It is a splendid tree in the forests of northern New Eng-

land and eastern Canada, where it is found from northern New Brunswick to the shores of Lake Winnipeg, but is less common and smaller southward. The leaves are destitute of hairs with the exception of the large conspicuous tufts in the axils of the veins on their lower surface which is light green and lustrous. Three other American species are established in the Arboretum, *Tilia neglecta*, *T. heterophylla* var. *Michauxii* and *T. monticola*. The first of these differs from *T. glabra* in the short, gray, finely attached pubescence which covers the lower surface of the leaves during the season and in the small inconspicuous tufts of axillary hairs. This is also a common northern tree which often grows with *T. glabra* and has been confused with it in books on American trees. It has a wide range from the valley of the St. Lawrence River in the Province of Quebec through the northern states, and ranges southward along the Appalachian Mountains to North Carolina, and westward to southwestern Missouri. This tree, which has not been many years in the Arboretum, has so far escaped the attacks of the red spider, has grown rapidly and proved to be a good tree. *T. heterophylla* var. *Michauxii* is a northern variety of a species widely distributed in the southeastern states. It differs from *T. glabra* and *T. neglecta* in the thick white down which covers the lower surface of the leaves early in the season and on the leaves of upper branches is often brown. It is a handsome tree with slender, reddish or yellowish branchlets and small, slightly flattened winter-buds. It occurs in western New York and is widely distributed southward from the valley of the Susquehanna and lower Ohio rivers, in the southern states being usually confined to the slopes of the Appalachian Mountains and their foothills. It is hardy in the Arboretum but has grown more slowly than *T. neglecta* and *T. monticola*. This last is the most conspicuous of the American Lindens which has been satisfactorily grown in the Arboretum. It is the tree which has been incorrectly called *Tilia heterophylla* in many books in which American trees have been discussed. It is found only on the slopes of the southern Appalachian Mountains from Virginia to North Carolina and eastern Tennessee, growing with *T. heterophylla* var. *Michauxii*. From that tree it differs in its much stouter branchlets, much larger compressed winter-buds, larger leaves very oblique at the base, often seven or eight inches long, thickly covered below with white tomentum and hanging on long slender stalks. The flowers are larger than those of any of the American Lindens. This Linden has grown more rapidly in the Arboretum than *T. heterophylla* var. *Michauxii* and promises to be a valuable tree in northern parks.

There are three Linden trees in western Europe, *Tilia platyphyllos*, *T. cordata* and *T. vulgaris*. The first has yellowish green leaves covered on the lower surface with short hairs found also on the young branchlets. This is the first of the European species to bloom in the Arboretum where it is growing with several of its abnormal forms, including one with deeply divided leaves (var. *asplenifolia*) one with slightly lobed leaves (var. *vitifolia*) and one of pyramidal habit (var. *pyramidalis*). These varieties are curious rather than beautiful and have little to recommend them as ornamental trees. *T. platyphyllos* appears to be the common Linden sold by American nurserymen as "European Linden." It is perfectly hardy but as an ornamental plant

is less desirable than the other European species. Much handsomer is the small-leaved *T. cordata* which is the last of the Lindens in the collection to open its flower-buds. The leaves are often broader than long, with a heart-shaped base, very dark green above and pale below, and rarely more than two and a half inches in length. This tree has grown slowly here and is still a broad, densely branched pyramid. Not common in American plantations, the Arboretum has not heard of large specimens in the United States. In central and northern Europe trees one hundred feet tall are not uncommon. The third of the Lindens of western Europe, *T. vulgaris*, is believed to be a natural hybrid between *T. platyphyllos* and *T. cordata*. It is a large tree with leaves dull green on the upper surface, lighter on the lower surface, and destitute of hairs except in the axils of the veins below. There are fine old specimens of this tree in the neighborhood of Boston, and it is the best Linden in this climate to shade city streets. It is this tree which has been so successfully used in Boston on Louis Pasteur Avenue which connects the Harvard Medical School with Audubon Road.

The Two Silver Lindens of eastern Europe, *T. tomentosa*, sometimes called *T. argentea*, and *T. petiolaris*, are handsome trees of unusual appearance which may often be seen in American parks. *Tilia tomentosa*, which is a common tree in the forests of Hungary, is a large tree with erect branches which in this country form a broad, compact, round-topped head and large leaves dark green above and snow-white below. This tree has been a good deal planted in the parks of New York City where large and handsome specimens can now be seen. It appears to be less well known in New England. *T. petiolaris* is a handsomer tree and one of the most beautiful of the exotic trees which can be grown in this climate, as can be seen in Newport, Rhode Island, where there are many noble specimens. It is a tall tree with drooping branches which form a narrow head, and leaves which are silvery white on the lower surface, and drooping on long slender stalks flutter gracefully in the slightest breeze. This tree is not known in a wild state and its origin is uncertain. *T. spectabilis*, which is believed to be a hybrid of *T. petiolaris* or *T. tomentosa* with *T. glabra*, is a handsome fast growing tree with the large leaves of the American species and silvery white below. This is one of the handsomest Lindens in the Arboretum collection. The var. *Moltkei* of this hybrid is a tree of denser habit and greener leaves, and in this climate a handsomer and more desirable tree than *T. glabra*. It originated many years ago in the Spaeth Nursery near Berlin. The Crimean Linden (*T. euchlora*, sometimes called *T. dasystyla*), is distinct in its dark green lustrous leaves, and is believed to be a hybrid between *T. caucasica* and *T. cordata*. This beautiful tree is hardy in the Arboretum, but does not grow as well here as the European species, certainly not as well as it does in some of the countries of western Europe where it has been used and is recommended as a street tree. *T. caucasica*, one of its supposed parents, is not in the Arboretum collection.

Asiatic Lindens have not yet given much promise of growing here into large or handsome trees. Nearly every species from eastern Asia which has been described has been planted in the Arboretum more

than once, and most of them are still growing here. They are all quite small with the exception of *T. japonica* which were raised at the Arboretum from seeds collected in Japan by Professor Sargent in 1892. It is a small tree here with leaves very similar to those of *T. cordata,* of which it has been considered a variety. The Japanese tree is chiefly interesting as it is the first of all the Linden trees here to unfold its leaves in the spring. When Lindens bloom is a happy time for bees, for the flowers of all contain large quantities of nectar. Unfortunately those of *T. tomentosum* and *T. petiolaris* are poisonous.

Hypericum Buckleyi, the first of the genus to bloom here, has already opened its flowers in the Shrub Collection. This is a rare plant found only on a few of the high mountains of North Carolina, but has proved perfectly hardy in the Arboretum where it has been growing for many years. It forms a dense mass of slender branches less than a foot high, covered with small yellow leaves, and early in July with small bright yellow flowers. This is an excellent plant for the rock garden and for a ground cover or the border of a shrubbery.

Rhododendron maximum superbum. A plant under this name came to the Arboretum a few years ago from a Connecticut nursery. It has leaves shaped like those of *R. maximum* but only six inches long, and blossoms two inches across the expanded corolla; this is deep rose color on the margins of the lobes shading to white toward their base and marked on the upper lobe by many orange-colored spots. It is probably a hybrid of *R. maximum* with one of the hybrids of *R. catawbiense.* Plants raised from this cross by Charles Sander at Holm Lea in Brookline have the general appearance of *R. maximum superbum,* but they have longer and more lustrous leaves pale on the lower surface, and on some of the plants much larger clusters of handsomer flowers. There is an old plant, evidently the same hybrid, in what was the garden of Mr. Francis Parkman on the western shore of Jamaica Pond in Jamaica Plain. This plant has even longer leaves than the Sander plant and rather paler-colored flowers. This and one or two of the Sander plants are as handsome as any Rhododendron with pink or rose-colored flowers which can be grown in this climate. They bloom at the same time as the white-flowered hybrid, probably a hybrid of *R. maximum* and *R. catawbiense* raised many years ago by Anthony Waterer at Knaphill and named by him *R. Wellesleyanum,* from Mr. Hunnewell's estate at Wellesley. This plant is now flowering in the Arboretum. These maximum-catawbiense hybrids seem destined to play an important part in the decoration of parks and gardens in the northeastern United States where few Rhododendrons and other broad-leaved evergreen plants can be grown. They are as hardy as the hardiest of the catawbiense hybrids and bloom two or three weeks later than these, prolonging the flowering period for hybrid Rhododendrons to the middle of July, that is when the conspicuous flowers of trees and shrubs are not abundant.

NEW SERIES VOL. XII NO. 15

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. JULY 30, 1926

Hydrangeas. These plants bloom in the Arboretum during nearly three months and are important flowering shrubs in the northern states. The first species to flower here is the so-called Climbing Hydrangea, *H. petiolaris*, which has already been mentioned in these Bulletins this year and which when in flower on the Administration Building is one of the great sights of the Arboretum. A few days later the plants in the group of shrubby Chinese species opened their flowers which are arranged in broad flat-topped clusters surrounded by a ring of large pure white ray flowers. The best known of these, *H. Bretschneideri*, a native of the mountains near Peking, was first raised in the Arboretum forty years ago and is a large, vigorous, hardy plant with dark green leaves and one of the best of the exotic shrubs which flower here in the middle of June. Closely related to it are *H. xanthoneura* and its varieties *Wilsonii* and *setchuenensis*, and *H. Rosthornii* raised here from seeds collected by Wilson in western China. These plants are hardy and flowered well this year on the eastern slope of Bussey Hill and on Hickory Path near Centre Street. Geographically interesting as garden plants, they do not appear to be in any way superior to *H. Bretschneideri*. Of the species which bloom here in July and perhaps the handsomest of all the shrubby species is *H. quercifolia*, a native of the southeastern states. This is a shrub with branches densely covered with rusty tomentum, deeply lobed leaves up to eight inches in length and flowers in elongated pyramidal clusters. It lives in the Arboretum but is not really hardy here, and the stems are often killed to the ground. In Mr. Richardson's garden in Brookline there is a magnificent specimen which this year is covered with innumerable

flower clusters. *H. arborescens* and *H. cinerea* with flat flower clusters are common woodland shrubs southward, and have no great value as garden plants. There are monstrous forms of the two plants on which all the flowers are sterile, forming nearly globose white heads. A form of *H. arborescens* (var. *grandiflora*) has become in recent years a popular garden plant with American nurserymen, by whom it is sold in great numbers. The handsomest of the entirely hardy American species, *H. radiata*, is a native of the elevated regions of North and South Carolina. It is distinguished by its broad leaves which are dark green above and snow white below, and by its broad clusters of flowers surrounded by a ring of large white sterile flowers. In gardens this Hydrangea is a broad and shapely shrub, and one of the handsomest of the midsummer flowering shrubs in the Arboretum. It was once fairly common in cultivation but now nurserymen do not cultivate it, and how many gardeners of the present day have ever seen it?

Hydrangea paniculata. Three forms of this Japanese shrub or small tree are in the Arboretum collection. The flowers of the three forms are borne in large, terminal, oblong, pointed clusters and the long, acuminate, dark green leaves make the plants attractive before the flowers open and after they fade, although like those of other Hydrangeas they fall in the autumn without change of color. The clusters of fertile flowers on what is considered the typical form are surrounded by the ring of white sterile flowers to which Hydrangeas owe the beauty of their inflorescence. This form, which is a handsome and valuable garden plant, will not be in bloom for another month. There is, however, an early flowering form (var. *praecox*) which is now just opening its flowers, and which is very similar, except in its time of flowering, to the type. This form has, however, rather larger and whiter ray flowers, and is a more ornamental plant. Indeed, when in flower in early July it is one of the handsomest shrubs in the Arboretum. This early flowering form appears to be exceedingly rare in American gardens. This unfortunately cannot be said of the third form of *H. paniculata* (var. *grandiflora*) on which the entire inflorescence is composed of sterile flowers which form a great cone-like white mass of abortions which as they fade turn to a dirty red. This plant has been propagated and sold by American nurserymen during the last fifty years by hundreds of thousands, possibly by millions, so that it is now perhaps more generally cultivated throughout the country than any other garden shrub, and certainly no other shrub has done so much to disfigure the surroundings of the homes of the people of the northern United States. A few years ago the only plant within the fence which surrounds Jefferson's Grove at Monticello was *Hydrangea paniculata grandiflora*. And Thomas Jefferson published in 1784 in his "Notes on the State of Virginia" the first comprehensive list of the plants of his native state, among which are some of the most beautiful trees and shrubs in the world.

Aralia spinosa. This is a common tree growing usually in the neighborhood of streams in the region from western Pennsylvania to Missouri, and southward to northern Florida, Louisiana and eastern Texas. It is a slender tree thirty or thirty-five feet high with a stem rarely

more than eight inches in diameter and wide-spreading branches furnished, like the young trunk, with stout scattered prickles. The leaves, which are clustered near the end of the branches, are from three to four feet long and about two and a half feet wide, on stems from eighteen to twenty inches in length which clasp the branches with their enlarged base, and are usually armed with slender prickles. The small, greenish white flowers appear in August in many-flowered umbels arranged in broad compact panicles three or four feet long which rise above the leaves singly or two or three together from the end of the branches. The small black fruit ripens in early autumn. This Aralia is now thoroughly established at the northern base of Hemlock Hill in the rear of the plantation of Laurels (Kalmia) and is spreading to a considerable distance from the original plant by means of underground stems from which new plants rise.

Aralia chinensis is so closely related to the American species that it has sometimes been considered a geographical variety of that tree. *Aralia chinensis* appears in the Arboretum collection in several varieties. The best known of these varieties, a native of Manchuria and eastern Siberia (var. *mandschurica*), is a hardier plant at the north than the American species and has been much more generally planted. In commercial nurseries it is often sold under the name of *Dimorphanthus mandschuricus*. Japanese and Chinese varieties of this Aralia, although less hardy than its Siberian representative, can be seen in the group of these plants near the junction of the Meadow and Bussey Hill Roads.

Ceanothus. Of this important North American genus, which is best represented in California, only two species of the eastern part of the country and one Rocky Mountain species, *C. Fendleri*, are hardy in the Arboretum where the beautiful Pacific Coast species cannot live. The two northeastern species, often called New Jersey Tea, *C. americanus* and *C. ovatus*, are shrubs two or three feet high and broad, with small white flowers in dense, oblong, terminal and axillary clusters produced on branches of the year. These two species vary chiefly in the shape of the leaves, but *C. ovatus* bloomed nearly a month ago, while *C. americanus* is just now covered with flowers. These plants are valuable for naturalizing on wood borders, and few shrubs make better returns in midsummer flowers than the New Jersey Tea which appears to be rarely cultivated. A large number of hybrids between *C. americanus* and some of the California species have been raised in Europe and one of these hybrids, known as Gloire de Versailles, with its large clusters of deep blue flowers, is a popular plant there. Unfortunately these hybrids, with a single exception, are not hardy in this climate. The exception is a beautiful plant with pale rose-colored flowers which came many years ago to the Arboretum from the Lemoine Nursery at Nancy, France. It has not been possible to find the name or trace the origin of this plant. It is now in bloom in the Shrub Collection and on the lower side of Azalea Path.

Calluna. Few Americans appear to realize that the Calluna, or Scotch Heather as it is called, can be successfully grown in all parts

of the eastern states and northern Canada where the soil is not impregnated with lime. Heather should be planted in well drained sandy soil in situations fully exposed to the sun, and the plants flower better if the stems are cut down to the ground in early spring. This prevents a straggling growth and insures a better bloom. The following varieties of *Calluna vulgaris* are established in the Arboretum: *alba, alba pumila, alba rigida, Alportii, argentea, aurea, cuprea, elata, erecta, Hammondii, humilis, hypnoides, minima, minor, monstrosa, multiplex, nana, pilosa, pyranaica, rigida, rubra, Serlei, spicata, tenuis, tomentosa* and *variegata.* The earliest to bloom, var. *rubra,* a dwarf compact variety with crimson flowers, is already covered with flowers.

Sophora japonica is, in spite of its name, a Chinese tree which has been cultivated in Japan for more than a thousand years, and as it first reached Europe from that country was long considered a native of Japan. It is a round-headed tree which in Peking, where it has been much planted, has grown to a large size and looks from a distance like an Oak tree. The leaves and branchlets are dark green, and the small, creamy white, pea-shaped flowers, which open here in August, are produced in great numbers in narrow, erect, terminal clusters. There are also in the collection the form with long, pendant branches, (var. *pendula*) which rarely flowers, and a young plant of the form with erect branches (var. *pyramidalis*). The form of this tree with flowers tinged with rose color (var. *rosea*) is not in the Arboretum. The Sophoras are on the right hand side of the Bussey Hill Road, opposite the upper end of the Lilac Group. Near them the Maackias are growing. They also belong to the Pea Family, and the better known *Maackia amurensis* is a native of eastern Siberia; it is a small tree with handsome smooth, reddish brown, shining bark, dull, deep green, pinnate leaves and short, narrow, erect spikes of small white flowers which open here soon after the middle of July. There is a form of this tree (var. *Buergeri*) in northern Japan which differs from the Siberian tree in the presence of soft down on the lower surface of the leaflets. The species discovered by Wilson in central China, *M. hupehensis,* is growing well in the Arboretum but has not yet flowered.

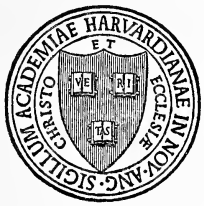
Late Flowering Barberries. Three species of Berberis from western China flower late in July, *B. aggregata, B. Prattii,* and *B. subcaulialata.* These plants will probably become popular for they are the latest of the Barberries to flower. They are all erect growing, tall shrubs with small yellow flowers in drooping clusters which are followed by red fruits. There are plants in the Shrub Collection and with the Chinese shrubs on the southern slope of Bussey Hill.

Amorpha canescens. This member of the Pea Family, the Lead Plant of the early settlers on the western plains, will soon open its small violet-colored flowers which are crowded on clustered terminal spikes and are set off by the hoary down which thickly covers the leaves and branches. This handsome and conspicuous plant grows three or four feet tall and is a native of the Mississippi valley where it is found on low hills and prairies from Indiana and Minnesota to Texas.

NEW SERIES VOL. XII NO. 16

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. AUGUST 5, 1926

Ash-trees. Judging by the number of inquiries sent to the Arboretum about these trees there is so much interest in them that we reprint the following article on the subject which appeared in one of these Bulletins several years ago:

Fraxinus is the name of the genus to which all Ash-trees belong, although it may be well to say that the trees called Mountain Ashes are not Ashes but belong to the genus Sorbus, a member of the Rose Family and closely related to the Pears, Apples and Chokeberries. Ash-trees occur in nearly every temperate part of the Northern Hemisphere, but are more abundant in species in eastern North America than in other parts of the world. Ash-trees fall naturally into two groups; the flowers of those of the first group are furnished with narrow white petals (*Ornus*) and the flowers of those in the second group are destitute of petals. The best known tree of the first group is the little tree called Manna Ash or Flowering Ash (*Fraxinus Ornus*), a native of southeastern Europe which has long been an inhabitant of the gardens of western Europe. It grows well in the middle Atlantic states, but has never been a success in the Arboretum where a tree which had flowered in 1917 was killed to the ground by the extreme cold of the following winter. Three of the flowering Ashes are natives of the United States, *Fraxinus cuspidata*, *F. Greggii* of the Mexican boundary region and *F. dipetala* of the mountain valleys of California. These three plants are not in the Arboretum collection where they would not be hardy, but Ornus is well represented here by two eastern Asiatic species, *F. Bungeana*, a small shrub from northern China which

was first raised here in 1882, and by the Japanese *Fraxinus longicuspis* which grows in the Arboretum both as a shrub with several spreading stems and as a small tree. Of the Ash-trees without petals and therefore with inconspicuous flowers there are seventeen species with a number of more or less distinct varieties which are natives of the United States. Six of these trees grow in the northeastern part of the country and three of them are common New England trees. To these trees color names have for no obvious reason been given, at least in books, for it is doubtful if these names have any general application among persons whose knowledge of trees has come from an intimacy of association with them in the forest or by the roadside, and not from the study of other persons' ideas about them recorded in printed pages. To persons who know trees from books White Ash, Black Ash, Green Ash, Red Ash and Blue Ash are familiar names. The most valuable of the American Ashes as a timber tree and one of the handsomest of the whole genus, the so-called White Ash, *F. americana*, grows naturally from Nova Scotia to Florida and eastern Texas, and westward to Nebraska and Oklahoma. It is a splendid tree, and when conditions of soil and rainfall favor it, grows often more than one hundred feet high with a tall massive trunk five or six feet in diameter. If anyone in northeastern North America wants an Ash-tree for shade or to produce timber, *Fraxinus americana* is the tree to plant. It grows, too, better in western Europe than most eastern American trees, although it will probably not become as good a tree there as the native Ash. A variety of *Fraxinus americana* (var. *crassifolia*) differs from the common form in its thicker, entire or only slightly toothed leaflets which are silvery white on the lower surface. This tree was raised at the Arboretum in 1874 from seeds collected at Mt. Victory in central Ohio. It is therefore now one of the oldest trees raised here. This Ohio tree has grown more rapidly and is handsomer than any other Ash-tree which has been planted in the Arboretum. Seeds of this tree usually reproduce the variety, and it is this variety which should be planted when the best possible Ash-tree is wanted in this part of the country. The Black Ash, *Fraxinus nigra*, grows as far north as Newfoundland and the shores of Lake Winnipeg, that is further north than the other American Ash-trees, and is a common New England tree. It grows naturally in deep cold swamps and on the low banks of lakes and streams, and long resisted every effort made to establish it in the Arboretum until Mr. Dawson tried the experiment of grafting it on roots of the White Ash. These grafted plants although still small are growing well in peat soil on the left hand side of the Meadow Road near the Rhamnus Collection. *Fraxinus pennsylvanica*, the so-called Red Ash, is another tree widely distributed over the eastern part of the continent from New Brunswick and southern Dakota southward. It is a smaller tree than the White Ash, rarely growing more than fifty or sixty feet tall, with a trunk less than two feet in diameter, a narrow head of thin foliage, and branchlets covered with pubescence. The inner surface of the bark of this tree is sometimes red when first cut; the wood is about as valuable as that of the White Ash, but for shade and ornament *F. pennsylvanica* is not worth planting. The Green Ash is now usually considered a variety of *F. pennsylvanica* (var. *lanceolata*), and is most abundant in the valley of the Mississippi River

and westward. It is easily distinguished by the bright green color of the two surfaces of the usually narrow leaflets. Seeds of the Green Ash germinate easily and quantities of seedling plants are found on the sand-bars and banks of many western rivers. It is a popular tree, therefore, in western nurseries, and, although not suited for the purpose, has been largely planted in the west as a street and shade tree, and occasionally also in the east for American nurseries have often substituted it for the White Ash. Another Ash of the Mississippi Valley, the Blue Ash of popular tree books, *Fraxinus quadrangulata*, owes its scientific name to its four-angled branchlets. This is one of the noble trees of the American forest, almost rivalling the White Ash in size. It grows naturally in limestone soil, but it has grown well in the Arboretum where it is helped by occasional applications of lime. Two southern trees related to the White Ash, *Fraxinus biltmoriana*, with densely pubescent branchlets, of the southern Appalachian region and westward, and *F. texensis* with rounded leaflets and a native of central and western Texas, are established in the Arboretum. Three species of the southeastern states and the five species of New Mexico and Arizona will probably never live long in Massachusetts, although the curious little *Fraxinus anomala* with square branchlets and leaves usually reduced to a single leaflet at one time flourished in the Arboretum during several years. *Fraxinus oregana*, the Pacific coast Ash-tree, is a large and handsome tree and one of the few valuable deciduous-leaved timber trees of the northwest. It has proved hardy in the Arboretum where it grows well but where it will probably never become a large tree.

Of the Old World Ash-trees the best known is *Fraxinus excelsior*, one of the important timber trees of the world, and as it grows in western and central Europe often a magnificent tree sometimes nearly one hundred and fifty feet high with a tall massive trunk three or four feet in diameter. A number of abnormal forms of this tree have appeared in European nurseries and plantations, but *F. excelsior* and its varieties are miserable trees in New England and should not be planted here. *Fraxinus rotundifolia* and its variety with pendulous branches are established in the Arboretum. They are small trees, natives of southern Europe and southwestern Asia, and although interesting from the botanists' point of view add little to the beauty of a collection of trees. An Ash-tree from Turkestan and Soongaria (*F. potamophylla*) was raised in the Arboretum in 1878 and has grown rapidly into a handsome, shapely and hardy tree. As an ornamental tree this is the most promising of the exotic Ashes which have been planted in the Arboretum. The great Ash-tree of northeastern Asia, *Fraxinus mandshurica*, inhabits eastern Siberia, Manchuria, Korea, and northern Japan. It is a really splendid tree and produces wood of exceptional quality. This tree was first raised in the Arboretum in 1878. It is hardy and grows well for a few years but soon begins to fail and becomes unsightly, and no place has yet been found in the Arboretum which suits it. In 1882 the Arboretum received seeds from Peking of *Fraxinus chinensis* var. *rhyncophylla*; it has grown well and has now flowered and produced fertile seeds for several years. It is a small and not particularly shapely tree, and is most interesting in winter, for the buds are unlike those of other Ash-trees and are globose, half an inch

in diameter with broad scales covered with a thick coat of rufous tomentosum. The outer scales, which are smaller than the others, do not as in most Ash-trees cover the bud which is enclosed by the second pair of scales; and on the terminal bud these outer scales are reduced to thickened reflex tips which stand out like ears. Several Ash-trees discovered by Wilson in western China have been raised in the Aboretum and are now growing in its nurseries. Of these *Franxinus platypoda* has grown the most rapidly, but it is too soon to form an idea of the value of these trees in American plantations.

Ash-trees require deep, moist soil and as they usually unfold their leaves late and lose them early in the autumn they are not good trees to plant to shade streets and sidewalks. They are often injured while young by borers, and they are all liable to suffer from the attacks of the oyster-shell scale.

Acanthopanax ricinifolius. This inhabitant of Japan and Korea sometimes grows to the height of seventy or eighty feet and forms a massive trunk with great wide-spreading branches armed, like the stems of young trees, with numerous stout prickles. To the shape of the leaves, which somewhat resemble those of the plant which produces the fruit from which castor oil is obtained, this Acanthopanax owes its specific name. The leaves, which are nearly circular and more or less deeply five- or seven-lobed, and fifteen or sixteen inches in diameter, hang on long slender stalks. The small white flowers are arranged in compact long-stemmed clusters which form a compound flat terminal panicle which varies from twelve to eighteen inches in diameter and is well raised above the leaves. In the early autumn the flowers are followed by small black and shining fruits. Of the trees growing in the Arboretum this Acanthopanax most departs in appearance from the trees of New England; and no other tree here is regarded with more curiosity. The largest specimen is growing by the side of the pond on the right hand side of the Meadow Road near its junction with the Bussey Hill Road; there is another large specimen in the mixed border plantation in the rear of the group of Viburnums near the junction of the Bussey Hill and Valley Roads.

Rhus javanica, an eastern Asiatic Sumach which is perhaps better known as *Rhus Osbeckii* or *R. semialata,* is a good August flowering tree in New England. In this country it is rarely twenty feet high, with spreading branches which form a broad round-topped head of handsome, light green, pinnate leaves with a broad-winged petiole and rachis. The flowers are white in erect, long-branched, pyramidal clusters, ten or twelve inches long and standing well above the leaves. The fruit is globose, about a quarter of an inch in diameter, red, and in compact clusters. The leaves of few trees or shrubs turn in the autumn to a more brilliant scarlet. For its showy August infloresence and the splendor of its autumn foliage this Sumach should find a place in the planting lists for northern gardens.

NEW SERIES VOL. XII NO. 17

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. AUGUST 12, 1926

The Ailanthus. The Tree of Heaven of the Chinese, which botanists now call *Ailanthus altissima*, although it is still better known as *Ailanthus glandulosa*, is one of the remarkable trees of the northern hemisphere. Raised in Europe in 1751 from seeds sent from Peking, the Ailanthus was one of the first Chinese trees known in western countries. The first Ailanthus was planted in the United States by William Hamilton in 1784 in his famous garden near Philadelphia; and in 1804 it was first planted in New England, near Portsmouth, Rhode Island, where it is still abundant. For many years little attention was paid to the Ailanthus in Europe until it was found that one of the silk worms could be successfully fed on its leaves. This discovery led to the establishment of great Ailanthus plantations in France where they have succeeded beyond the most sanguine expectations, the best results having been obtained in calcareous soil and on the sandy sea-coast. The date of the first planting in Europe of the Ailanthus as a street tree is not known, but when the streets of Paris were generally bordered by trees in the early years of the second Empire it was largely and successfully used for this purpose. As early as 1820 its remarkably rapid growth, the tropical appearance of its long gracefully drooping leaves, and its freedom from the attacks of insects attracted general attention to the Ailanthus in the United States. It was found to flourish equally well in the country and in the streets of New York and Philadelphia where it grows more rapidly than any tree which had been planted in those cities; and it was believed that a tree had been found which would take the place of all others for city planting. So

Bulletin No. 16 was paged incorrectly. Pages 61-64 will not appear in this volume.

great did the popularity of the Ailanthus become in a few years that the number of the trees planted was only limited by the ability of nurserymen to supply the demand. The popularity of the Ailanthus in the United States, however, was short-lived, for when the trees began to flower it was found that some of the flowers emitted a strong and to most persons an offensive odor, that the clouds of pollen shed from the flowers and the flowers themselves dropping on neighboring roofs so affected the water caught on them that it was unfit for use, and that the flowers which dropped on the ground made the city sidewalk and the country yard unbearably disagreeable. This peculiarity of the flowers discovered, the Ailanthus sank rapidly in popular esteem, and its general destruction in this country was advocated and put into execution.

Unpopular as the Ailanthus has become, it is one of the handsomest and most valuable trees in the world. Planted in cities it can resist better than any other tree heat, drought, dirt and gas escaping from defective pipes which menace the life of city trees. It grows rapidly even in the most unpromising situations; it is never seriously injured by insects; and few trees can be more easily propagated, for small pieces of the root covered with soil will soon grow into plants large enough to transplant. The suckers which the Ailanthus produces in great numbers from the roots are the real drawback to this tree, but when it is planted in city streets they are unable to force their way through brick sidewalks and concrete is impervious to them. The male and female flowers of the Ailanthus are chiefly produced on different trees; only the male flowers have a disagreeable odor and drop to the ground; the female flowers are scentless. In the clusters of female flowers occasional male flowers are found, but there are so few of these that their odor is not perceptible. It is perfectly easy to propagate only the female tree which is the one which should be planted, and apart from the absence of the disagreeable smell of the flowers it is more ornamental than the male, for the winged fruit of the Ailanthus, produced in great terminal clusters, is handsome and conspicuous in the late summer and autumn. The fruit is usually yellow, but in one variety it is bright red (var. *erythrocarpa*) and more brilliant and conspicuous than the fruit of any tree of large size which can be grown in the northern states. The leaves of the red-fruited variety are darker on the upper surface and paler below than those of the yellow-fruited form; and the handsomer leaves and more brilliant fruit make this the desirable form to cultivate. There is certainly no better tree than the Ailanthus to shade the streets of American cities provided they afford sufficient room for its development, for the Ailanthus even when it is planted in cities may become a tall, wide-branched tree, demanding space in which to display all its beauties. Although the attempt has not been made on a large scale in this country to fix shifting sand dunes by planting the Ailanthus, it has been successfully used for this purpose in Europe, especially in the neighborhood of Odessa on the Black Sea where large plantations of Ailanthus have been successful on sterile soil so shifting that other trees have not been able to secure a foothold on it. The Tree of Heaven produces valuable hard, heavy and close-grained wood of a pleasant clear yellow color, resembling that of satinwood; it is easily seasoned, and shows as little tendency to

shrink or warp as the best mahogany. Beautiful furniture has been made from Ailanthus wood raised in New England, and if the tree is ever grown on a large scale on the sandy now unused lands of our seacoast it will supply the cabinet-maker with wood which in quality and beauty equals that of the White Oak, the Black Walnut and the Wild Cherry. From experiments in the laboratories of the University of Wisconsin it appears that the wood of this tree can be profitably used in the manufacture of paper. It is an interesting fact that although the Ailanthus is now known in all the countries of the world which enjoy a temperate climate its true home in China, that is the region where it is a really wild tree, is still unknown to European and American botanists who have now travelled in nearly all parts of the Celestial Empire. Two other specimens of Ailanthus, *A. Giraldii* and *A. Vilmoriniana*, are known, however, as wild trees in western China. The former, which differs in the presence of prickles on the branches, has not proved hardy in the Arboretum; the other, which chiefly differs from the common Ailanthus in the downy covering of the young branchlets, is now established here but has not yet produced flowers or fruits. Small plants of *Ailanthus altissima setchuenensis*, *A. glandulosa pendulifolia* and *A. Duclouxii* are now in the Arboretum nurseries, but in view of the importance of this genus sufficient attention has never been paid to it in the Arboretum. Plants of *A. altissima* were first raised here in 1882 from seeds collected in Roxbury by Jackson Dawson and one of these plants which stood on the right hand side of the Meadow Road grew to a considerable size but died suddenly a few years ago without apparent cause.

Inquiries are often made at the Arboretum about the best trees to plant in northern cities where trees suffer badly or are killed from smoke and dirt. Persons interested in this subject are referred to an article published in the last July number of The Atlantic Monthly entitled "Are some Trees civilized?" by Don Knowlton, in which they are intelligently discussed, and it contains much useful information. His survey of the healthy trees in the smoke-covered region of Cleveland shows that the following trees can be relied on in such situations: the Ailanthus, the tree which he calls the European Sycamore, which is not that tree but a hybrid between the European and American species known as *Platanus acerifolium*, Catalpa, which is probably *C. speciosa*, the Carolina Poplar, Weeping Willow, Crack Willow and White Poplar.

Cedrela sinensis. The Arboretum saw last week for the first time fresh flowers of this Chinese tree of the Meliaceae Family produced on a tree in Mr. William L. McGee's garden in Bristol, Rhode Island, which is believed to have been planted more than thirty years ago. There is no record here that it has flowered before in the eastern states, and the only evidence of other American flowers in the Arboretum herbarium are those taken from a tree growing in the state of Washington. Plants raised from seed in the Arboretum in 1892 have grown well here on Peters' Hill and are perfectly hardy. This Cedrela appears to be rare in Europe, and we have been unable to find any record of its having flowered there. There are several species, of which *Cedrela sinensis* is the most northern in its distribution, while the others

are confined to Mexico, Brazil, Australia and India. *C. sinensis* is a tree from fifty to eighty feet in height, with large, long-stalked leaves, with ten to twenty-two oblong or oblong-lanceolate leaflets four to eight inches long, acuminate, slightly and remotely serrate and light green on the lower surface. The white flowers are produced in long, pendulous panicles with five subulate staminodes alternating with the stamens, and oblong or obovate fruit about an inch in length. The tree has the general appearance of Ailanthus and at one time was called *Ailanthus flavescens*. From Ailanthus this Cedrella can be easily distinguished by the few coarse teeth near the base of the leaflets, each bearing a large gland on the lower side.

Koelreuteria paniculata. This Chinese tree, which has been in bloom several days, is when in flower the most conspicuous of all the summer flowering trees which are hardy in this climate. It is a round-headed tree rarely more than thirty feet high, with large, compound, dark green leaves and large erect clusters of golden yellow flowers which are followed by great clusters of bladder-like pale fruits. This tree, which is hardy in Massachusetts, has been much planted in this country, especially in the gardens of the middle states. The Koelreuteria often appears in American nursery catalogues under the name of "Japanese Lacquer-tree," although it is not a native of Japan and has not lacquer-producing sap.

Aesculus parviflora, the summer-flowering Buckeye, is still flowering, and is covered with its tall narrow spikes of small, slender, white flowers with long exserted stamens. This is perhaps the most conspicuous of the summer flowering shrubs, with the exception of Hydrangeas, which are hardy in the Arboretum. It is a native of the southeastern states from South Carolina to Florida and Alabama, and nowhere abundant it appears to be most common in northern Alabama. It has long been a favorite in gardens in which it produces stems seven or eight feet high, and in good soil and with sufficient room spreads into great thickets often twenty or thirty feet across.

Cotinus. In the Sumach Group, on the left hand side of the Valley Road and opposite the Evonymus Group, the Smoke-tree (*Cotinus coggygria*), is in bloom. The flowers are very small, in loosely arranged clusters and are not at all conspicuous, and it is their much lengthened hairy colored stems which are interesting and showy, and make this plant such a feature of the summer garden. The fruit is small and of no particular beauty, but in the autumn the dark green leaves sometimes assume dull shades of red and orange. The Smoke-tree is a native of southern and southeastern Europe, the Himalayas and western China, and is perfectly hardy in New England where it was probably brought early from Old England where it was cultivated soon after the middle of the seventeenth century. In the same group there is a large specimen of the American species *C. americanus*. This as it grows in the south is sometimes a tree thirty feet tall with a stout trunk a foot in diameter, but here in the Arboretum it is always bush-like in habit.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 18

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. AUGUST 19, 1926

Ulmus procera. A European Elm, formerly united by Linnaeus with other European species under the name of *Ulmus campestris*, a name which must be abandoned, is now generally known as *Ulmus procera*. It is a common tree in southern and western Europe, and possibly a native of southern England where it is common, but if not it must have been early introduced into that country. This is an interesting and valuable tree in eastern Massachusetts where it was first planted in Milton by Mr. John Smith who brought some of these trees from England about 1734 and planted them on his farm on Brush Hill. A few of them are probably still standing and have produced a grove of suckers several of which transplanted from Milton have grown into large trees. The largest of the trees on the original Smith farm are from seventy-five to eighty feet tall with trunks eight to ten feet in circumference three feet above the surface of the ground; but by the roadside on Milton Hill, on the estate of Mr. E. James, seven of these trees are standing. The three largest have trunk circumferences of thirteen feet four inches, twelve feet five inches and nine feet five inches. Although possibly younger, there are now larger specimens of this tree on the Rice Estate on Pond Street, Jamaica Plain, which are believed to have been planted by Francis Bernard, colonial Governor of Massachusetts from 1760–1769, who built the original house and planted the trees which he probably imported from England during his term as Governor here. The largest of the four Elms has a trunk girth of eighteen feet six inches and is the largest I have found in Massachusetts. Unfortunately they must soon disappear as the estate is being divided into small house lots.

The so-called Paddock Elms on Tremont Street in front of the Granary Burying Ground were planted by or for Mr. Gilbert Deblois, a well known citizen of Boston who lived on Tremont Street at the north corner of Bromfield Street, opposite the Burying Ground. He was a friend of Mr. John Smith of Milton who gave him the trees. In return for these Deblois agreed to name his new-born baby for Smith. The records of King's Chapel show that James Smith Deblois was baptized by Reverend Henry Carver on May 16, 1769, which fixes the time when the trees were planted. Mr. Deblois, an active business man, employed Adino Paddock, coach maker, the windows of whose shop overlooked the trees, to look out for their protection. That this guardian of the trees attended faithfully to his duties is shown by the fact that he twice offered a reward for the discovery of those who injured them. About 1870 the question of removing these trees began to be discussed by the city government. In February, 1874, Alderman Powers said:— "Never has a petition come from a citizen of Boston for their removal but thousands of petitions have come against it, many from some of the heaviest taxpayers of Boston." At a meeting later in the month it was voted nevertheless to destroy these trees, and on the 27th of that month Mayor Cobb signed an order for removing the Paddock Elms. In the Boston Herald of Sunday, March 1, 1874, it was said: "The Paddock Elms are in the hands of the destroyer. The well known forms of the ancient Elms that for a hundred years have kept watch and ward on the old Granary Burying Ground on Tremont Street have at last fallen a victim to the onward march of modern improvement, and beneath the sturdy blows of the woodman's axe have been laid low. At twenty-one minutes past eleven on Saturday morning the most northern tree fell to the ground, and in ten minutes the next, until six had fallen, and the boughless forms of five stood."

On Beacon Street, between Joy and Park Streets, there are now standing nine of these trees. To them Mr. Joseph Henry Curtis has devoted a volume, published in 1910, entitled "Life of Campestris Ulm, the oldest inhabitant of Boston Common," containing excellent pictures of some of these trees. Several of them were planted as early as 1780. The largest, often called the Hancock Elm because it was planted by John Hancock directly opposite his mansion, has a trunk circumference of fifteen feet. Mr. Curtis does not say where these trees were obtained but, like the Paddock Elms, they were probably some of Mr. Smith's Brush Hill suckers. The row of these Elms which once stood on the Tremont and Boylston Street Malls of the Common was probably planted at the same time and the trees were perhaps obtained from Brush Hill. There are now only two of these trees left, one on Tremont Street and one on Boylston Street, the others having been destroyed in making the Subway between 1895 and 1898.

On Main Street, Dedham, in front of the house now occupied by the Dedham Community Association, there are three specimens of this Elm which are said to have been planted in 1789 by Judge Haven who was the first Judge of Probate of Norfolk County. The largest of these trees has a trunk sixteen feet in circumference three feet above the ground; the others have trunks thirteen feet three inches and thirteen feet six inches in diameter. No one knows where they were obtained, but it is not impossible that they also came from Milton. On the

Slocum Estate, Jamaica Plain, there is, close to Pond Street, a fine row of ten tall trees of this Elm with a trunk circumference averaging ten feet six inches at four feet above the ground. The origin of these trees is not known, and this is true of three trees of about the same size on Boylston Street opposite the Brookline Reservoir. One of these is on the old Lee Estate and two are close to the road on the Galen L. Stone Estate. On the north side of Warren Street near Boylston Street stand two fine specimens of this tree, one with a trunk circumference of ten feet four inches and the other of twelve feet four inches.

Of the younger of these trees near Boston the best are those which were planted on the grounds of the Chestnut Hill Reservoir in Newton and the western edge of Brookline in 1876 by Mr. Desmond FitzGerald which, if they continue to grow in the future as they have in the past will make before this century is over one of the glories of Massachusetts and an appropriate monument for the public-spirited and intelligent man who planted them. There is a long row of these trees bordering the road on the south side of the highway on that side of the Reservoir, and a number of individual trees on the eastern or Brookline end of the Reservoir grounds. Many of the Reservoir trees are already from fifty to sixty feet in height with trunks varying from eight to eleven feet in circumference.

It was proposed to plant the green on Commonwealth Avenue west of Dartmouth Street with two rows of this Elm. This was done but a resident of the Avenue, more public-spirited than intelligent, made such a loud-mouthed protest against only two rows of trees in the Avenue that he succeeded in getting four rows planted in a space hardly wide enough for two rows, and these trees are doomed to inevitable failure and will soon have to be replaced. The best of the young Elms of this species in Boston border the two sides of the short street directly east of the Art Museum. There are twenty of these trees, all in excellent condition, with an average circumference of trunk of four feet six inches. One tree between Pond Street and Jamaica Pond, which is supposed to have been planted about 1865, is a shapely and healthy specimen with a trunk circumference of nine and a half feet. I have seen photographs of two trees planted about 1843 near the house on Highland Ave., Rochester, N. Y., occupied by Mr. George Ellwanger. These trees have a trunk circumference four feet above the surface of the ground of eleven feet ten inches and ten feet ten and a half inches.

Ulmus procera is a tree sometimes in Europe one hundred and fifty feet tall, producing many suckers, but at the north never bearing seeds, with dark, deeply furrowed bark, ascending branches forming a narrow head, slender branchlets pubescent when young, and sometimes developing corky wings, and ovoid, minutely pubescent buds. The leaves vary from ovate to broad-elliptic, and are shortly acuminate, very oblique at the base, deeply serrate with about twelve pairs of veins, dark green and scabrous above, soft-pubescent below with axillary tufts and short pubescent petioles. In the Arboretum herbarium are fruit-bearing specimens of planted trees of this Elm collected at Cordova and Aranjuez, Spain.

Attention is called to the fact that among these Elms are the largest planted trees in Massachusetts, and the oldest with the exception of the still living wreck of the Endicott Pear tree at Danvers.

Indigofera. Five species of this genus of the Pea Family are now blooming in the Arboretum. They are small plants with handsome flowers in terminal racemes, well suited to decorate a garden border. The three species with pink flowers, *I. Kirilowii*, a native of northern China, Manchuria and Korea, *I. Potaninii* and *I. amblyantha* are perfectly hardy and the last will continue to open its small flowers on the lengthening racemes until October. The other species, *I. Gerardiana* and *I. decora*, are killed to the ground every winter, but like herbaceous plants produce new stems in the spring which never fail to flower during the summer. *I. decora* is a native of southern China, and in the Arboretum the flowers are pure white. *I. Gerardiana*, which is a native of the northwestern Himalayas, has gray-green foliage and rose-purple flowers. This is the least beautiful of the five species now growing in the Arboretum. The collection still needs *I. hebepetala*, another Himalayan plant which is rarely seen in English gardens. It has red flowers, in elongated racemes, and, judging by the picture of it which has been published, is a handsome plant. This and another red-flowered Himalayan species, *I. atropurpurea*, are desired by the Arboretum.

Japanese Grape Vines. To Japan the Arboretum is indebted for *Vitis Coignetiae*, the handsomest Grape Vine which can be grown in the northern states. No other species is more hardy, grows so vigorously, or produces such large leaves which are thick, prominently veined and pale on the lower surface; they turn bright red in the autumn, and as this is a northern species their fading colors are more brilliant in northern New England than they are in Massachusetts. The small black fruit, which is eaten in Hokkaido, has little to recommend it to the American palate. *Vitis amurensis* from eastern Siberia, Mongolia and Korea is an old inhabitant of the Arboretum. It is a handsome and perfectly hardy plant, but not superior as a garden plant to several of the American species. The Japanese *Vitis pulchra* is distinct in the dark red color of the leaves and shoots in the spring, and is a handsome and interesting plant. This Vine is known only from cultivated plants, and only the male plant is in the Arboretum collection.

The ripening of fruits has already begun and the varied and beautiful fruit of many trees and shrubs will make the Arboretum an interesting place to visit for several months, and one of the best places in America to supply birds with food. Although not yet ripe the bright red "keys" of the Tartarian Maple are now the showiest fruits in the Arboretum. They are the chief ornament of this hardy little tree of southeastern Europe and western Asia (*Acer tataricum*), many years ago much more often seen in American gardens than it is now. The fruit on several Bush Honeysuckles is ripe or nearly ripe. A few of the most conspicuous of these plants now are those of the hybrids of the Tartarian Honeysuckle (*Lonicera tatarica*), called *L. bella*, *L. muendeniensis*, and *L. notha*. There are varieties, too, of *L. tatarica* with red and with yellow fruit which are attractive at this season of the year and the bright yellow flowers of *Lonicera Ruprechtiana* var. *xanthocarpa* make a great show in early July. The red fruits covered with hairs of *Rhus canadensis*, often called *R. aromatica*, are also ripe.

These Bulletins will now be discontinued until the autumn.

COMPLIMENTARY
NEW SERIES VOL. XII NO. 19

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN OF POPULAR INFORMATION

JAMAICA PLAIN, MASS. NOVEMBER 1, 1926

Autumn in the Arboretum. It is not probable that the Arboretum has been more beautiful during the months of September and October than it has this year. The trees have not before been fuller of leaves and the grass as green at this season of the year. Many leaves, especially those of the Oaks, are still green; those of several trees have turned gradually and brilliantly, and the beauty and interest of the Arboretum has been increased by abundant crops of beautiful and brilliant fruits. This is particularly true of the fruits of many Crabapples in the great collection near the base of Peter's Hill, and by that of many Hawthorns, Honeysuckles, Viburnums and Cornels. The leaves of many plants have already changed their color and fallen, and this is true of those of the two trees of *Phellodendron amurense* on the right hand side of the Meadow Road. This is an exceedingly rare species in cultivation, and it is almost as beautiful after the autumn coloring of the bright yellow leaves has disappeared and left the gray trunks and branches bare, making this tree one of the conspicuous winter features of the Arboretum. Nearly all the forms of the American Horsechestnuts, or Buckeyes as they are called, turn brilliantly in the early autumn and have already fallen. The Sugar Maples are now brilliant objects and while the leaves have fallen from many Red Maples others retain their bright colors. The tree directly opposite the Administration Building in the Arboretum is a good example of this, and landscape gardeners who may wish to use trees and shrubs for autumn effects can find useful suggestions in this tree, for it has been raised from a graft taken from a tree with leaves of exceptionally brilliant autumn color. This exceptional color has been

preserved, and indicates that it is possible to graft plants with leaves of unusually brilliant autumn color just as it is possible to propagate trees with leaves abnormally marked with yellow or otherwise abnormal, or with double or other unusual flowers, or with improved fruits. Little has yet been done anywhere to propagate trees for their autumn colors, but the field is an interesting and important one for the makers of autumn gardens. That the making of such gardens will sooner or later receive attention in this country there can be little doubt, for the pleasantest months of the year are the autumn months, and in no other part of the world is the autumn foliage so brilliant and nowhere else are the fruits of trees and shrubs more abundant, varied and interesting.

Flowering Dogwoods. Among the smaller trees with scarlet or crimson autumn foliage none is more beautiful now than the so-called Flowering Dogwood *(Cornus florida)*, which is unusually brilliant this year with its leaves of scarlet and green. Its autumn beauty is increased by the contrast in the color on the upper and lower surfaces of the leaves for only the upper surface changes color, the lower surface retaining the pale sometimes nearly white color of the summer. For regions with a winter climate as severe as that of eastern Massachusetts its eastern Asiatic relative *(Cornus kousa)* and especially the variety *chinensis* are more reliable plants. They are smaller trees than the eastern American plant but the leaves turn as brilliantly in the autumn; the flower-buds are not killed or injured by the severest cold of our winters and open from two to three weeks later, and the floral bracts which surround the clusters of small flowers and are the conspicuous feature of the inflorescence are narrower, further apart and pointed, not broad and rounded, at the apex. The fruit is even handsomer than that of the American plant for the individual fruits are united into a globose scarlet head which is raised on a long slender erect stem and are not, like those of the American plant, in clusters of separate fruits. The form discovered and introduced by Wilson from western China promises to be a better plant in this climate than the Japanese form, for it is equally hardy and the floral bracts are larger and overlap below the middle, forming a cup like those of the American species. This plant is still rare, but as it produces good crops of seeds in the Arboretum it is hoped that it will soon be within the reach of lovers of handsome hardy trees.

The Sassafras *(Sassafras variifolium)*. This is one of the most beautiful and apparently one of the least known trees of eastern North America. It is interesting as the only member of the trees of the Laurel Family which is native to this part of the country, and is an aromatic tree with deeply furrowed red-brown bark, scaly buds, slender bright green lustrous branchlets, brittle branches containing a thick mucilaginous pith and marked by small semiorbicular elevated leaf-scars displaying single horizontal rows of fibrovascular bundle-scars, and stout stoloniferous roots covered by thick yellow bark. The flower-buds are terminal, ovate, acute, protected by nine or ten imbricated scales increasing in size from without inward, the

three outer scales being ovate, rounded and often apiculate at the apex, keeled and thickened on the back, pale yellow-green below, dull yellow-brown above the middle and deciduous at the opening of the bud. The leaves are ovate or obovate, entire or sometimes three-lobed at the apex, the lobes being broadly ovate, acute, divided by deep broad sinuses, and gradually narrowed at the base into elongated slender petioles, as they unfold light green and somewhat pilose on the upper surface with scattered white hairs, ciliate on the margins, and clothed on the lower surface with a loose pubescence of long white lustrous hairs, at maturity becoming thin, dark dull green above, pale and glabrous or pubescent below. The small yellow flowers open in early spring with the first unfolding of the leaves, the males and females usually on different individuals, in lax drooping few-flowered racemes developed from the axils of the large ovate bud-scales, the upper flowers of the lowest raceme opening first. The calyx is pale yellow, divided nearly to the base into six narrow obovate lobes, rounded or incurved at the apex, spreading or reflexed after anthesis, those of the inner series a little longer than the others; the nine stamens are inserted in three series on the somewhat thickened margin of the shallow concave calyx-tube, those of the outer series opposite its outer lobes; filaments flattened, elongated, slightly enlarged toward the apex, incurved, light yellow, those of the inner series furnished near the base with two conspicuous orange-colored stipitate glands; the anthers are introrse, four-celled, the cells superposed in pairs, the lower longer than the upper, opening from below by persistent lids, in the female flower reduced to flattened, ovate, dark orange-colored, stipitate staminodia, or occasionally fertile and similar to or only slightly smaller than those of the staminate flower; the ovary is ovate, one-celled, light green, glabrous, nearly sessile in the short tube of the calyx, contracted into a slender, elongated, simple style gradually enlarged above into a capitate, oblique, obtusely lobed stigma. The fruit is an oblong, dark blue, lustrous berry surrounded at the base by the enlarged and thickened obscurely six-lobed or truncate, scarlet limb of the calyx, raised on a much elongated, scarlet stalk thickened above the middle. The wood is soft, weak, brittle and coarse-grained, although very durable when placed in contact with the soil, and is aromatic and dull orange-brown with thin light yellow sapwood composed of seven or eight layers of annual growth; it is largely used for fence-posts and rails, in the construction of light boats and in cooperage. The roots of Sassafras, and especially their bark, are a mild aromatic stimulant, and oil of sassafras used to perfume soap and other articles is distilled from them. Gumbo filet, a powder prepared from the leaves by the Choctaw Indians of Louisiana, gives consistency to gumbo soup. In the middle of the sixteenth century the French in Florida learned from the Indians the medicinal value of Sassafras, and in 1569 the first account of this tree was published by the Spanish physician Monardes. Exaggerated ideas of the curative properties of Sassafras soon spread through Europe and efforts were made to secure large supplies of the wood and roots. The tree is little injured by insects or by serious fungal diseases. In the south it occasionally grows to the height of eighty or ninety feet with a trunk sometimes six feet in diameter and

short stout more or less contorted branches which spread almost at right angles from the trunk; at the north it is much smaller and often a shrub. The leaves vary from four to six inches in length and from two to four inches in width, and in the autumn turn to delicate shades of yellow and orange more or less tinged with red. The flowers are produced in racemes about two inches in length and a third of an inch in diameter when fully expanded. The fruits, which ripen in September or October and are a third of an inch long, are raised on stalks an inch and a half to two inches in length. Exceedingly abundant in some years, the fruit of the Sassafras is usually produced rather sparingly, and is devoured by birds as soon as it begins to assume its brilliant colors. This beautiful and interesting tree is distributed from eastern Massachusetts through southern Vermont to southern Ontario and central Michigan, eastern Iowa, eastern Kansas and the Indian Territory, and southward to central Florida and the valley of the Brazos River in Texas. The Sassafras was probably one of the first North American trees used in European gardens, as the figure of the plant published in 1633 in Gerard's Herbal was made from a specimen which had grown in a garden near London. The Sassafras can be propagated by seeds which should be sown as soon as ripe when they will germinate early the following spring, or by root suckers which are often produced in great profusion. The large thick fleshy roots which penetrate deep into the ground make the Sassafras difficult to transplant and only small plants should be selected for the purpose. The genus is also represented by two species which occur in eastern Asia and which have not yet proved hardy in the Arboretum. No other American tree of its beauty and interest has been so rarely planted in this country as the American Sassafras, owing perhaps to the idea that it is difficult to transplant. Certainly it cannot be found in any American nursery, and it is doubtful if it occurs now often in Europe. There are two or three natural groups in the Arboretum and the largest and handsomest is perhaps on the border of the woods directly behind the collection of Crabapple at the base of Peter's Hill. There is another group nearly as large above the Hawthorns on Peter's Hill, and there are a male and a female plant on the right hand side of the road opposite the Lilacs which were collected in West Roxbury and planted there in 1878 but are not conspicuous or handsome plants.

Deciduous-leafed trees of pyramidal habit. Although much less numerous than pyramidal conifers, all pyramidal trees with leaves which fall in the autumn are worth the attention of tree lovers. The best known of these is the variety *italica* of the European Black Poplar *(Populus nigra)* from which it differs in its tall, narrow growth, glabrous young shoots and its confirmed habit of suckering from the roots. This tree, the so-called Lombardy Poplar, has been universally planted in Europe and was early introduced into the United States.

NEW SERIES VOL. XII NO. 20

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS. DECEMBER 10, 1926

Conifers. There are few regions less suited to the successful cultivation of Conifers than eastern New England and the Arboretum has reason to be satisfied perhaps with its success in increasing the knowledge of these plants and of their cultivation. Of the conifers of western North America only a few of those which grow west of the Rocky Mountains can be successfully cultivated in New England. None of those confined to the southern states, southern Europe, southern Asia, or northern Africa, or any part of the southern hemisphere, are hardy here, so of the thirty genera of these plants now recognized only fourteen can be found in the Arboretum. This means that some of the great conifers of the world like the two Sequoias, several of the Pines and most beautiful Firs, and the Araucarias are not in the collection. The Arboretum collection has been increased in three ways,—by the discovery of new species, the study of the range of others in the hope that the widely distributed species may be found in some parts of their range which will prove hardy here, and by the appearance of new forms here among the seedlings of well known species.

Of the new species of conifers introduced by the Arboretum the most important are those raised from seed which Mr. E. H. Wilson brought from western Szechuan near the borders of Tibet in 1910. In this collection is a Cephalotaxus, two forms of *Pinus sinensis*, two Larches, thirteen Piceas, six Abies and one Juniper. No other seeds of these trees have been collected, and all now in cultivation were raised and distributed from the Arboretum or from seeds distributed in Europe from this collection. The trees are all growing well in the

Arboretum with the exception of *Picea Sargentiana* which does not appear to be perfectly hardy here, but there are numerous plants in Europe raised from Mr. Wilson's seeds. These trees cannot be purchased in any American or European nursery, and it would be an exceedingly difficult and expensive undertaking to make another collection of the seeds for many years, at least, for central China is now in an extremely disturbed condition and unsafe for European travelers.

Other Asiatic conifers introduced by the Arboretum are *Abies holophylla, Abies koreana* and *Thuja koraiensis* from Korea, *Picea Koyamai, Juniperus communis* var. *nipponica, J. conferta* and *J. rigida* from Japan.

Of other introductions of the Arboretum *Tsuga caroliniana,* the Carolina Hemlock, as it grows here is generally considered the most graceful and beautiful cone-bearing tree in the collection. It is a native of the Blue Ridge, the eastern range of the Appalachian Mountains on which it grows from southwestern Virginia to northern Georgia usually in scattered groves on the rocky banks of streams at elevations between two thousand five hundred and three thousand feet. For some reason not easy to explain it escaped the attention of botanists who explored the southern Appalachian Mountains during the last half of the eighteenth and the first half of the nineteenth century, and its distinct character was first noticed by Dr. L. B. Gibbes of Charleston, South Carolina, although it was not described by Dr. Engelmann until thirty-one years later. First raised at the Arboretum in 1880 the tallest tree here is now about forty feet high, that is nearly as high as it usually grows in its native habitat, although trees occasionally seventy feet high are said to occur. It is therefore a much smaller tree than the northern Hemlock. The branches are more pendulous and the leaves are darker green and more lustrous than those of the latter; the leaves, too, are usually notched at the apex and slightly toothed, while those of the northern tree are usually rounded at the apex and are not toothed. The two trees, however, are best distinguished by their cones; those of the southern tree are not stalked and their scales are much longer than broad with obtusely pointed bracts, while those of the northern tree are stalked and the scales are about as long as wide and broad and truncate at the apex.

Picea Engelmannii, which is the common and most widely distributed Spruce of the Rocky Mountains, was discovered in Colorado in 1862 by Dr. C. C. Parry. It is probably one of the most important introductions of the Arboretum. Seeds are said to have been sent by Dr. Parry in that year to the Harvard Botanic Garden, but there is no record that plants were raised there, and it is believed that the tree was first cultivated in 1879 when seeds were planted in the Arboretum. On the Colorado mountains Engelmann's Spruce is sometimes one hundred and fifty feet high with trunks up to five feet in diameter, although further north and south the trees are smaller, growing in great forests which fifty years ago covered the slopes of these mountains up to altitudes of ten thousand feet, and with its light cinnamon red bark and narrow pyramidal crown of soft light

gray green leaves it was one of the handsomest of all Spruce trees. The tallest trees in the Arboretum are now nearly forty feet high and the trunks of the largest trees are naked for a distance of seven or eight feet from the ground. It is a good ornamental tree to plant in New England for its hardiness, the rapidity of its growth and the value of its timber may make it a valuable tree for planting in the northeastern states. From all points of view *Picea Engelmannii* is certainly the best Spruce which has been planted in the Arboretum.

Picea omorika from southeastern Europe was first raised in the Arboretum in 1880 from seeds presented by the late Dr. Bolle of Berlin, and is one of its best introductions. The tallest trees here now are more than forty feet tall with trunks clothed to the ground with short branches which form a narrow pyramid covered with leaves dark green and lustrous on the dorsal surface and pale on the other. This tree, which is perfectly hardy in the Arboretum, is one of the handsomest conifers in the collection where there are several individuals.

Among the hardy trees obtained by the Arboretum by studying the extended range of several species the most important and certainly the most interesting is the Cedar of Lebanon which has been found to grow in Asia Minor on the Anti-Taurus far north of the Lebanon Range in Palestine and in a much colder climate. As the Palestine Cedar is not hardy in New England the Arboretum had seeds of this tree collected on the Anti-Taurus with the view of introducing a hardy race of Cedars into New England. The seeds were sown here in the spring of 1902 and a large number of plants were raised. They all proved perfectly hardy, not one having suffered from cold, although once or twice in severe winters they lost most of their leaves, the buds being uninjured. Some of the trees have been lost in attempts at transplanting for no other tree has proved so difficult to move. The rapidity of their growth is shown by some of the Arboretum trees which have reached the height of twenty-one feet in thirteen years, and several of them are now more than thirty feet high. Another important tree obtained by the study of its range is the Douglas Spruce, *Pseudotsuga taxifolia*, raised from seed collected in Colorado, which is perfectly hardy and has grown rapidly, although this tree from the northwest coast is not hardy in New England. In the coast region of the northwestern states and British Columbia, *Thuja plicata*, the western Arborvitae, grows to a great size and is one of the handsomest and best timber trees of North America. Fortunately it ranges eastward to Idaho and northern Montana, and from this cold region it was brought to the Arboretum in 1879. It is the largest and handsomest of the Arborvitaes, and is believed to be one of the handsomest and most satisfactory conifers which has been planted in the Arboretum.

Pacific Coast Conifers. Of the conifers of the Pacific coast of North America which can be grown in the Arboretum the White Pine, *Pinus monticola*, is the most successful here. It is hardy, grows rapidly, and although not more beautiful or as valuable as the native White Pine, *Pinus Strobus*, it is a tree well worth attention in New England.

The Sugar Pine, *Pinus Lambertiana*, which on the California Sierra Nevada becomes the largest of all Pine trees, is perfectly hardy here and is in good condition although it grows slowly. The White Fir of the California Sierras, *Abies concolor*, lives here in good condition for many years but is a less valuable tree in this climate than the form of the same species derived from Colorado. *Abies nobilis* can live here in sheltered positions but does not become a tree, although the beautiful *Abies amabilis* which grows with it on the mountains of Oregon and Washington does better but grows slowly, and has now been in good condition in the Arboretum for several years. Another tree which is rarely seen in northern collections, *Libocedrus decurrens*, the Incense Cedar of California, is in good condition in the small collection of conifers near the top of Hemlock Hill in an exceedingly sheltered position. The Incense Cedar is a tree of narrow columnar habit with bright green foliage, and in California sometimes grows to the height of one hundred and fifty feet and forms a massive trunk. The two beautiful White Cedars of the northwest coast, *Chamaecyparis Lawsoniana* and *C. nootkatensis*, can just be kept alive in the Arboretum where they drag out a miserable existence. Jeffrey's Pine, *Pinus ponderosa* var. *Jeffreyi*, lives here but that is all which can be said about it. It is possible, too, to grow here the White Fir of the northwest coast, *Abies grandis*, and the coast Hemlock, *Tsuga heterophylla*, raised from seeds gathered on the Rocky Mountains of Idaho as these two trees also range far inland.

Torreya nucifera. Of the genus Torreya, which is related to the Yews, there are six species found in Florida, California, Japan and China. The Japanese species, *T. nucifera*, is well established in the Arboretum, and one of the trees has produced a few green olive-like fruits. In Japan this Torreya is a magnificent tree sometimes ninety feet high with a massive trunk and a dense crown of dark green shining leaves. It should be better known in this climate where it is apparently one of the rarest of exotic trees. The best specimen is in the Hunnewell Pinetum at Wellesley, Massachusetts. The peculiarity of this Torreya is that it does not begin to grow until July. In spite, however, of its short growing season it makes long annual shoots and increases rapidly in height. There is a group of this tree among the Laurels at the base of Hemlock Hill, and there is a plant of *Torreya californica* among the exotic conifers near the top of Hemlock Hill where it has been kept alive for several years by careful winter protection. As an ornamental tree it has nothing to recommend it in this climate.

Most of the genera of conifers with a single species are successfully grown in the Arboretum. Of these, Taxodium, the deciduous Cypress, is confined to the southern United States and is one of the remarkable trees of eastern North America; Pseudolarix, Sciadopitys and Cryptomeria are Asiatic. Cryptomeria can just be kept alive in the Arboretum; on Long Island, and southward it does better. Sciadopitys, the Japanese Umbrella Pine, is hardy in Massachusetts. It is an interesting and handsome tree, forming a dense pyramid while young. It grows so slowly, however, that it will not be popular with planters with whom rapidity of growth is the chief merit of

trees. For the northern states and for general cultivation the most valuable of the monotypic Asiatic conifers is certainly the Chinese Golden Larch, *Pseudolarix amabilis*, a tree with deciduous leaves and large cones erect on the branches with scales which fall when mature from the axis of the cone like those of Fir trees and the Cedar of Lebanon. Robert Fortune, who was sent to China by the London Horticultural Society in 1843 as a botanical collector, first made this tree known to Europeans. He found it in temple gardens growing in pots and much stunted, and it was not until 1854 that he found it growing in open ground at the monastery of Tsan-tsin. The stems of these trees, growing at an elevation of from one thousand to fifteen hundred feet above the level of the sea, measured fully five feet in circumference two feet from the ground and carried this size, with a slight diminution, to a height of fifty feet, this being the height of the lower branches. The total height of the trees varied from one hundred and twenty to one hundred and thirty feet. In spite of all the efforts which have been made to introduce this tree into Europe it has not become common there. The largest specimen in Europe is in the Rovelli nursery at Pallanza in Italy. In 1907 this tree was sixty-four feet high with a trunk ten inches in girth. There are a few of the original trees in France, Germany and Belgium, the largest being the tree in the nursery of the Horticultural Society at Calmpthout near Antwerp.

If the Arboretum collection of living conifers is not a large or particularly successful one owing to the climate, its herbarium contains representatives of every known genus and is probably the best in the world.

These Bulletins will now be discontinued until the spring of next year.

INDEX TO VOL. XII

Synonyms are in *italics*